

# CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society  
Of America

Vol. XV

DECEMBER, 1943

No. 12



FIG. 76  
*Rebutia violaciflora*  
Color photo by George Olin



## CACTUS AND SUCCULENT JOURNAL

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## AFFILIATE NOTES

Mail your news items monthly to Mrs. Maybelle Place, 645 W. 40 Place, Los Angeles 37.

*Midwest Cactus and Succulent Society:* The November meeting was held at the home of Franklyn Williams, Lorain, Ohio. Mrs. Charles Amata gave a talk on *Ariocarpus*. Mr. Rodgers writes in *Spine Tips*, "I have several of my large Epiphyllums with nice buds, several of my plants are showing the wet season by spindly growth. I hope to winter all of the Epiphyllums." Also from their Bulletin, "Have you sent in that gift subscription for the JOURNAL? Everybody is doing the Xmas shopping early, even for civilians; \$3.00 gives 12 gifts yearly."

*Henry Shaw Cactus Society:* The November meeting was set aside for the election of officers for the coming year and we hope to have the list in the next issue. From Mr. Kropp in their *Cactus Digest*, another idea for removing *Opuntia basilaris* glochids, "A good way to remove the minute size spicules is to put a piece of ordinary adhesive tape on the affected area and pull off—presto! No thorns." A. W. Garbrant says, "Although the season is late, may I pass along one comment on grafting? Where an *Opuntia* or similar stock is used, particularly in cleft grafts, a very simple aid is a spring clothespin. It is only necessary to push a spine through to prevent squeezing out and slip on the clothespin, being sure the tension is not too great. On small flat grafts an inverted jelly glass is often ideal for providing the necessary pressure and seems to aid further by preventing too rapid drying of the parts." After reading Mr. Cutak's descriptions of *Ariocarpus fissuratus* and *Acrodon belliflorus* in his *Cactographs*, you decide you must add these to your collection.

*Heart of America Cactus Club:* The club met at the home of Mr. and Mrs. Nazer and the lecture subjects were 'Lithops' by Billy Ann Carter and 'Pest Control' by Mr. Rose. It was decided at the October meeting not to hold an election this year and keep the present officers for the duration. Mrs. Boruff's article on 'Desirable Succulents' in their *Bulletin* was fine and I am sorry not to be able to give you all of it.

*Southwest Cactus Growers:* When a cactus club meets at the garden of Mr. William Marshall, you may be sure the meeting will be an interesting one, and when the host is also the speaker of the day, it is a double treat. The subject of Mr. Marshall's talk was 'Epiphytic Cacti in Nature.' We are presenting it to you on page 178.

November and December are election months for quite a number of the Affiliates. Will you kindly send the list of your new officers, so that we may start the new year with a bang. It has been a great pleasure working with the Affiliates this past year and I wish to thank you for your splendid co-operation and let's make for the coming year, a Bigger and Better Affiliate Column.

## CHRISTMAS GREETINGS

This Christmas issue of the JOURNAL is presented to you with the Editor's greetings and with a sincere hope that the new year will bring a just and lasting peace.

If you like this issue, please renew your memberships promptly so that you will not miss the following articles now in preparation:

Cacti in Indiana and These Delightful Mesembryanthemums..... R. H. Lahmeyer  
The Astrophytum Family..... Jay E. Gilkey  
With Our Commercial Dealers..... Guy Quinn  
Mazatlan and Cephalocereus purpusii. Edgar M. Baxter  
This Cactus Hobby and Travelogue..... Wm. Taylor Marshall

Continuation of Spine Chats and Cereusly Speaking  
Name for Sedum XYZ..... R. T. Clausen  
The Beauty of the Cactus by an Australian Member..... C. J. White

Echinocereus subinermis..... George Lindsay  
Genus Cochemia..... George Lindsay  
And articles by the many other regular contributors.

We feel fortunate that in this country we have been allowed and even encouraged to continue publication of our JOURNAL during the war and we have the materials to carry us through 1944. During this new year you will see the publication of three or more books that you have been waiting for. Among them will be Dr. Craig's book on Mammillarias and the Epiphyllum book.

Again we thank our loyal contributors for their patience with our many delays but with their help we can guarantee that Volume XVI will please you. See next issue for index and binding instructions for Volume XV.

SCOTT E. HASELTON.



FIG. 77. *Sedum craigii*. Photo by J. R. Brown.

## A New Species and Section of *Sedum* from Chihuahua

By ROBERT T. CLAUSEN

In Mexico there occur a number of stonecrops which possess certain characteristics which are used for separating genera of the Echeverioideae from *Sedum*. The inflorescence is axillary in some of these species as in the Echeverioideae. The petals are erect in others, but the inflorescence is terminal. Despite such conditions, these species are similar in having the petals distinct to the base as is the usual condition in *Sedum*. The species to which I refer constitute a group which appears connected with the typical subgenus of *Sedum* by other species intermediate in character. At the same time plants of this group exhibit various specializations which distinguish them from the other subgenera of *Sedum*. Berger's sections *Pachysedum*, *Dendrosedum*, *Fruticisedum* and *Leptosedum* include the species which I have in mind. Fröderström referred them to his groups *Dendroideum*, *Oxypetalum*, *Bourgaei* and *Conzattii*. Walther (this Journal 2:457. 1931) included

many of these species in his section *Bergerosedum*. I prefer to regard this series of species as belonging to several sections which together constitute a subgenus, that is a group equivalent in rank to *Gormanina*, for discussion of the status of which see Bull. Torr. Club 69 (1):27-40 (1942). The species of this series are all native either in Mexico, Central America or northern South America. Distinguishing characteristics of this subgenus are the perennial stems which are terete and sometimes rather woody, the alternate persistent leaves and the somewhat shrubby habit. For this group of species I take up the sectional name of Berger, *Pachysedum*, the concept of which I emend to include various species of the sections *Dendrosedum*, *Fruticisedum* and *Leptosedum*. The proper name thus is subgenus *Pachysedum* (Berger) Clausen, stat. nov. (Sect. *Pachysedum* Berger, in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 18a:447. 1930). The sections of subgenus *Pachysedum* are so distinctive

that each may be regarded as constituting a separate genus if desired, but sharp lines cannot be drawn between such potential segregate genera, while phylogenetic relationships can be expressed just as well by considering the little genera as sections of a subgenus of *Sedum*.

The plant which is the subject of this discussion first came to my attention through the agency of R. V. Moran. In October, 1942, he sent me a small cutting with a query regarding the genus to which it belonged. This was a difficult question to decide. The leaves were thick and succulent, extremely glaucous and alternate. Placed in some earth, the cutting took root and soon produced a small axillary inflorescence. The habit and lateral peduncle at once suggested *Graptopetalum*, but the petals were distinct to the base, recurved at the apex and almost immaculate, characteristics more of *Sedum* than of *Graptopetalum*. The erect petals, recurved at the apex, suggested *Lenophyllum*, but in that genus the leaves are definitely and regularly opposite on the lower part of the stem. Further, in *Lenophyllum* the flowers are almost sessile and arranged in elongate, spike-like cymes. Also, the epipetalous stamens arise near the middle of the petals and the carpels are connate for about one fifth their length in *Lenophyllum*, while in the new plant the carpels were distinct, not connate, and the epipetalous stamens were free almost from the bases of the petals. This plant could not belong to *Lenophyllum* and it seemed even more distinct from *Echeveria* and *Villadia*. Actually it seemed as near to *Sedum* as to any of these other genera. It afforded no new or unique features not already found in some existing species of *Sedum*. The axillary inflorescence is a characteristic of *Sedum pachyphyllum*, *S. treleasei* and *S. cremnophila*, among others. The erect petals, recurved at apex, are a feature of *S. wrightii*, another species also known from Mexico, and various oriental species. These, the most distinctive features of the unknown plant, thus occur in other species of *Sedum*. Accordingly, I prefer to describe the new plant as a species of *Sedum*, creating for it a new section of the subgenus *Pachysedum*. For notes regarding the original collection of this plant and for permission to publish the following description, I am grateful to R. T. Craig. Also, I wish to thank Reid Moran for originally sending me the cutting which he had obtained from the collection of Mr. J. R. Brown.

**CRAIGIA**, sectio nova subgeneris *Pachysedum* generis *Sedum*, inflorescentiis axillaribus; floribus petalis erectis, recurvatis ad apicem, distinctis ad basin; foliis alternis, crassis, carnosiss. Species typica est **SEDUM CRAIGII** R. T. Clausen, sp. nov., perennis, caule carnosissimo, procumbente, foliis alternis, sessilibus, carnosiss, planis vel aliquando concavis ventraliter, convexis dor-

saliter, oblongo-ellipticis, sursum inflexis, obtusis, 2-5 cm. longis, 0.9-2.2 cm. latis, 0.5-0.8 cm. crassis, subpurpureis, glaucis; inflorescentiis axillaribus et floribus in cymis, pedunculis 1.0-3.5 cm. longis, subpunicis, bracteis floreis linearibus, 2-4 mm. longis, pedicellis 4-7 mm. longis; sepalis elliptico-linearibus, subacutis, 4-5 mm. longis; petalis oblongo-lanceolatis, acutis, minimum angustioribus ad basin, erectis usque ad basin longitudinis, divaricatis et recurvatis ad apicem, albis obscure striato-subpunicis, 7-8 mm. longis; staminibus 4-6 mm. longis, antheris subflavo-albis; squamis obovato-reniformibus, emarginatis, albis, 0.6 mm. longis, 0.8 mm. latis; pistillis erectis, 5-6 mm. longis. Typus est collectio Reid Moran, n. 1478, in herbario Cornell University, Ithaca, N. Y. Species ab R. T. Craig in Chihuahua, Mexico originaliter collecta est.

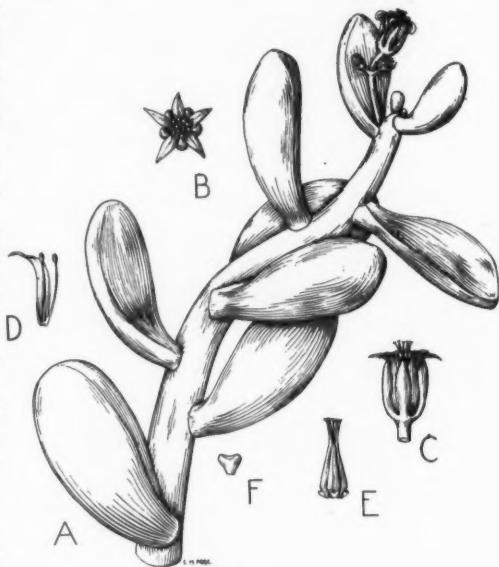


FIG. 78

*Sedum craigii*. Drawings by Miss E. M. Abbe from a cutting from the type collection. A. Habit sketch (x 1). B. Flower from above (x 2). C. Flower from side (x 2). D. Petal and two stamens (x 2). E. Carpel (x 2). F. Nectar scale (x 4).

My reason for naming and describing this new species derives from the fact that we need some definite record of and means of designating this interesting plant. Its precise status must yet be determined by further observation and cytological studies. The most distinctive characteristics of *Sedum craigii* are the thick glaucous leaves, the axillary inflorescence and the erect petals which are spreading and recurved only at the apex. By this combination of features, it can be separated from all other known species of *Sedum*.

Dr. R. T. Craig has furnished the following information about the original collection of the species. "This plant was collected by us on the canyon wall of the Barranca de Cobre of the Rio Urique branch of the Rio Fuerte in S. W.

Chihuahua at ap. 7000 feet. The flora at the brink of the Barranca shows two types, that found over the edge on the canyon wall, a 3-4000 foot cliff, shows succulents, few cacti and plants usually found at lower and warmer levels. That back from the brink showed no succulents, more cacti, pines and typical higher level vegetation. This can possibly be accounted for by

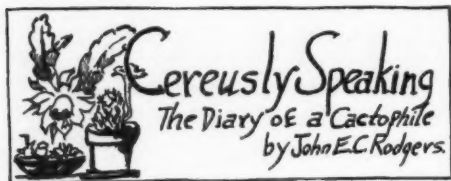
the fact that there is a very strong draft of warm air up from the canyon. Collected by Lindsay-Craig expedition, April 4, 1939." See page 71 to 74 of the JOURNAL for a fuller account of the habitat.

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FIG. 79. One of six similar windows in the sun room of Henry C. Shetrone, Cincinnati, Ohio. Look closely for the orange-colored large inflorescence of the *Grassula falcata*, center, below.





## CULTURE IN OHIO

December 1 Gave a gallery talk to 24 Girl Scouts on how to "mix soil, make cuttings and water plants" for a merit badge. Gave each of them *Bryophyllum pinnatum*, *tubiflorum* and *Graptopetalum paraguayense*—as an extra inducement I offered a prize for the best grown plants at the end of three months. A letter from an unsigned correspondent in Massachusetts, I quote, "My *Aloe variegata* broke off just above the roots two years ago this fall. I set it in sand hoping to root it. It didn't root. It threw up a long stalk of flowers every bit as beautiful as the one it had when on its own roots. This spring still unrooted, it threw up two 12 to 15 inch flower stalks. This fall I found it had rooted. This experience would tend to substantiate the story in "Succulents for the Amateur" (see page 149) that it will continue to bloom for three years hanging up out of the soil." Have two *Aloe variegata* budded now.

December 3. Tenacious of life these cactus. In 1931 Gene Ziegler gave me a single pointed section of *Ariocarpus trigonus* with brown fuzz at the base. It rooted for me but it never developed a new plant. Today I showed it to three guests. It has two bulbous base roots which have fibrous roots from each. Survival but not propagation. Just a curiosity. Now I'm going to see how long it will survive. At our last midwest meeting Mrs. Charles Amato gave a paper about *Ariocarpus*. Yes, sir—you're right, I decided to get the other ones, all interesting and culturally pos-

sible for the average amateur.

December 5. Got eight adult plants today and did I profit by my experience of last year? I did—clipped all large roots back to one inch from body, let dry and put in sand pocket in pot of good potting soil. Will know next spring when growth commences and all eight start putting out buds how much experience has taught me. I did it once and I'll do it again and again. *Billbergia nutans* in bloom in east window—arresting color combination—flamingo pink, lettuce green and blue.

December 8. *Echeveria rosea*, *gibbiflora*, *metallica* and *Pachyveria "grusonii"*, the peacocks of my collection are now at their best. On dry side in rich but well drained soil. Old rose iridescence, bronze burnished copper and green-blue suffused with blue-lavender. They stop traffic like a red light with their color harmony—par excellence. I use pulverized clay in all of my soils (rose growers hereabouts claim clay gives roses color-divine). Why not succulents?

December 11. *Chameocereus silvestrii* hanging from mullions in strong light with moisture enough to keep them in good health but no etiolated winter growth. This method got results last year had blooms on four different plants. All had light from above next to glass, good ventilation, two good waterings a week which means water dripping from drainage hole. Used tepid spray of water to wash off grime from my whole collection.

December 12. At Dr. and Mrs. James F. Machwart's for annual Christmas dinner—pot luck—fourteen of us sat down to a well laden table. Our "plant in a poke idea" added a lot of suspense for all of us. We "midwesterners" are no slouches when it comes to succulent and cacti gifts for our Christmas party. I got a fine grafted *Euphorbia lanata*. Stayed until after 7 p. m., so we could see new colored slides of cacti and succulents.

December 14. Found another way to say one of my favorite quotations, "I like books for friends because I can shut them up when I don't want to listen." Arthur F. Williams, England, quotes a continental

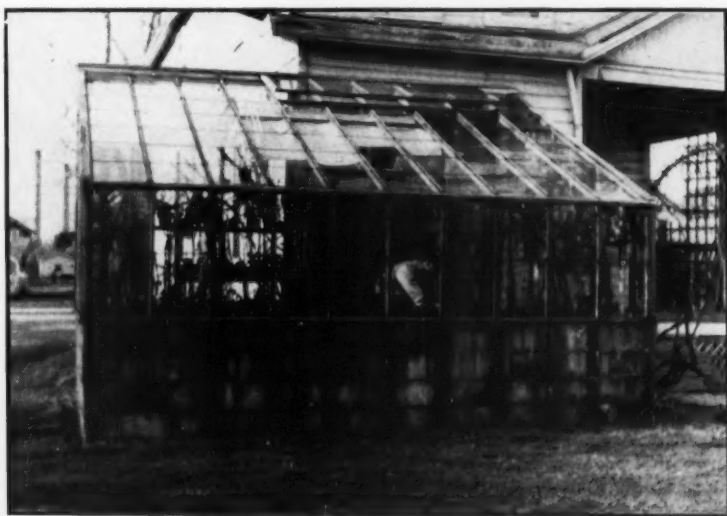


FIG. 80. John Rodgers taking notes in his glasshouse. "Cereusly Speaking" has been of more help and interest to the amateur grower than any series that has been published in the JOURNAL. John lost his co-author, Sandy, and mother of three children, last June. Who said growing things—and cacti have no purpose?



FIG. 81. Ohio glasshouses must have shades and ventilators for summer and heat for winter. John is counting days until he can turn off the heat.

friend after viewing snapshots of him in his greenhouse, "I am pleased to see you amongst your silent friends." Yes, silent but how eloquent they become when treated with consideration and understanding.

December 16. Read where Xerophytic plants often linger on for six to ten months after being frosted or chilled. Well, February 25, 1943, my fire went out while the outside temperature was  $21^{\circ}$ . It was  $26^{\circ}$  inside greenhouse when I discovered it. I have lost so far a large *Euphorbia splendens* and a few cactus plants. Ten months are almost passed and the rest look fine. No doubt stored heat in soil, pots and plants protected them for the time—perhaps a half hour or so.

December 18. *Tetranychus telarius* (red spiders—

a mite really) enjoying its annual family reunion in *Coryphantha octacantha*. If I were to make a list of plants that insects leave alone in my greenhouse I would put Euphorbias at the top of the list—unanimous, isn't it? At present I'm making such a list with no "bug fanciers." I have several hundred plants I've observed for three to ten years and I believe of this number I could, without too much grief, discard twenty-five or thirty and keep a clean collection with very little trouble. I find Rebutias, Coryphanthas, Echinocereus and Harrisias the worst offenders in my collection as well as the others I have visited. First day of Christmas holidays. Do I need them? My plants? They always do.

December 25. *Opuntia subulata*, thanks to quick

thinking, has its side arm. Wind blew my four foot plant over and broke off one of trident arms last September. Wired it into place and pinned it with its own spines. Wrapped same with soft cord. Now good as new. Healed up and growing with original beauty saved. Plant is seven years old from four-inch cutting. Well, all of my friends took me at my word and gave me money, so I could buy plants and books. Nice idea—cash. Perhaps I shall use it for bonds and guarantee a cactus or two in 1953.

December 27. *Stetsonia coryne* responded to treatment of Dr. Bernhardt, Brooklyn, New York. Had brown scar tissue over growing point. Dr. B. suggested removing this and "sometimes plants resume normal growth," I did, it did. Nitrogen from manure water or fertilizer often remedies this same trouble without treatment suggested by Dr. B. The brown scars and drying back at the ends are caused by deficiencies in the plant's diet, I understand.

December 29. Mr. Williams, Lorainite, with Florida yearnings, told me about seeing *Opuntias* in southern Florida growing partly submerged in the ocean sand with yellow roots which were salt-water saturated when high tide covered this part of the beach. He saw an *Opuntia* but I have reliable reports that there are *Harrisias* and *Acanthocereus* growing on hummocks that get the same treatment. Can it be our Florida cacti are able to grow and get nourishment by some unknown method? Dr. Machwart claims he has seen the *Opuntias* but the yellow sections are pads that have been covered up. He thinks the plants are growing in sub-soil where ground is not saline. No, I'm not advocating salt water baths either just curious as to the how and why they are able to grow.

December Dear Diary, I little thought when I began my introduction, "Have you ever kept a record of your hobby, fellow hobbyists?" in the February, 1942, JOURNAL followed by the January column that it would see another year. But it has and I shall begin January, 1944, soon, in my third five-year plan. Each time I approach my task with misgivings, but so far you have been patient—fellow cactophiles. From your letters, pictures and personal experiences I know I shall be able to write a better column this coming year. Here's to two years of enjoyable correspondence with my many-letter-friends and to you who have taken an interest in "Cereusly Speaking"—a Happy New Year to all of you.

*Culture Cues for January* (to finish my one year's calendar as I'm always a month behind)

1. Another dark month to supplement with artificial light two hours before sunrise and two hours after sunset to insure blooms on early cacti and succulents.

2. Keep in mind that even dormant plants often show etiolation after placing in good light from too early forcing.

3. Suggest exhibit to club members and get place to exhibit. Don't let competitive spirit die.

4. Keep *Euphorbias* moist but not wet and in best light possible.

5. See that hardy *Opuntias*, *Sempervivums* and other rockery plants are not affected by thaws—cover ground with coarse sand to prevent heaving.

6. Continue spraying twice a week with tepid water to keep dirt off and supply necessary moisture (in greenhouse).

7. At the first sign of red spider use a spray of cold water frequently to discourage these pests.

8. Give special attention to the following plants which have budded or bloomed in January in previous years: CACTI: *Hariota salicornoides*; *Lepismium commune*; *Schlumbergera russelliana*; *Rhipsalis cereuscula*, *cassutha*, *grandiflora*, *houlettiana*; *Epiphyllum ackermannii*, *Epiphyllum Guatemalense* and *E. cartagense*; *Rebutia minuscula*; *Echinocereus knippelianus perbella*; *Cereus marrisonii*; *Aporocactus flagelliformis*; *Wilcoxia schmollii*; *Mammillaria stella-aurata*, *hemispherica*; *Astrophytum asterias*, *myriostigma*, *capricornis*. SUCCULENTS: *Glottiphyllum linguiformis*; *Euphorbia pseudocactus*, *mammillaris*, *fourieri*, *splendens*, *candelaria*; *Gasteria verrucosa*; *Aloe ciliaris*, *variegata*, *arborescens*; *Kalanchoe fedtschenkoi*, *blossfeldiana*; *Echeveria linguafolia*, *pulvinata*; *Graptopetalum* species; *Ceropegia woodii*, *barkleyii*; *Sansevieria cylindrica*; *Crassula multicaeva*; *Senecio stapeliiformis*; *Haworthias cuspidata*, *cymbiformis*; *Pedilanthus variegata*; *Stapelia grandiflora*.

I would like to get in touch with some members who raise and flower cacti in their homes without the advantage of a greenhouse.

MRS. WALTER VON PECKMANN,  
53 Crestmont Rd., Binghamton, N. Y.

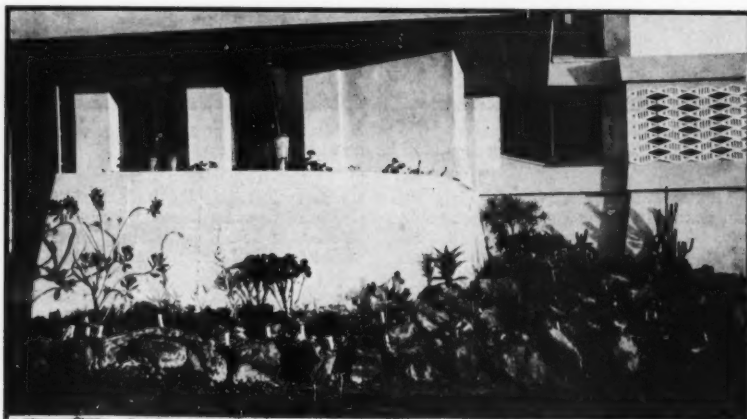


Fig. 82. A foundation planting for a home. In the colder localities a summer arrangement is made by sinking pots.





FIG. 83. Parklands are converted into vegetable gardens.

## GARDENING IN WAR-TIME ENGLAND

By VERA HIGGINS

### EDITOR'S NOTE:

Mrs. Vera Higgins has made many friends through her own cactus books and translations of other authors. More important duties in England have temporarily caused the suspension of their *Cactus Journal* of which she was editor. Among her war duties Mrs. Higgins is editing the Royal Horticultural Society's *Journal* and other publications. The following is quoted from her letter: "We do feel encouraged that America is in with us and producing material at such a splendid rate. Your naval boys have just come to London and we are getting used to their white hats and cigars. I hope you will be able to maintain your *JOURNAL* throughout the war and keep the Society together. People do want something to interest them when off duty and the growing of plants is one of the most restful and best relaxations to take one's mind off one's troubles."

If the Englishman's home is his castle, his garden too is included within the ramparts. Whatever area of ground he possesses—acres or rods, a great estate or a window box—the average Englishman takes a delight in the things he can grow there. And interest in intelligent gardening has spread in the last few decades so that the small gardens in the suburbs round our great cities are no longer encumbered with dingy hedges of laurel and privet (to us, a garden is an enclosed space) but are planted with flower-

ing shrubs, Buddleia and Berberis and Ceanothus, the borders with many herbaceous plants and the rock garden with choice alpine.

Before the war, vegetables available in the shops were cheap and good—and we did not enquire whence they came. It was probably a revelation to many a housewife to learn that only 2 per cent of the indispensable onion supply was grown in this country, that Holland sent us lettuce, France young carrots and Italy cauliflower; and that, although we could produce most kinds of vegetables, the country was not producing anything like the full requirements of her people. Market gardeners specialized in crops that gave the best returns; large gardens generally had a space set aside to provide the chief requirements of the household, but small gardeners preferred to use their limited space for flowers and left the supplying of "utility crops" to the greengrocer.

The gardening instinct, however, was there, well developed, a fertile soil for the government's "Dig for Victory" campaign. Some, at first, were cautious and waited to see how urgent the need would really be. Others dug up their lawns and sacrificed everything from the start.

Some with no garden or with insufficient space took allotments. This term covers any vacant space used for the production of vegetables; an allotment is not attached to the owner's house but is usually part of some large area, the use of which has been granted for this purpose by the appropriate civic authority. The standard size of an allotment is ten rods (about 90 ft. by 30 ft.) The allotment movement is long established in this country; during the last war the number of holders increased greatly and many have continued to cultivate their plots in the intervening years; but at the present time a far greater area is under this type of cultivation than ever before all over the country; one town alone, near London, with adequate garden facilities for the majority of its residents, has already increased the number of allotments from 2500 to 8000 and is confident of achieving its target of 10,000. A National Allotment Society, aided by local branches, is responsible for giving as much help as possible, by providing skilled advisers, by organizing shows to foster enthusiasm and by planning the co-operative purchasing of seeds, tools and fertilizers.

And now, in the fourth year of war, there can be few who have not made some effort—tomatoes have even been ripened on the windowsills of London flats—and many, who were knowledgeable in other branches of horticul-

ture, have delighted to acquire a new skill with vegetables.

A feature of many English gardens is the greenhouse, a form of protection much used in this country, which varies in type according to the use to be made of it. An unheated structure is used to protect rare alpine which cannot stand our damp winters, and many small gardens will have a heated house to bring on flowering plants for decoration and to raise seeds of tender plants for the garden. Large establishments will have a range of houses of varying temperatures and designs adapted to their different purposes, some devoted to flowers, others to fruit and vegetables. Many a good collection of exotic plants is housed in a small greenhouse in a small garden, carefully and intelligently tended by an enthusiastic amateur gardener-owner. The necessity of conserving fuel has resulted in an order prohibiting the heating of private greenhouses except under special permit, so that any collection of plants that is not adjudged of "national importance" is likely to be lost this winter. Houses devoted entirely to food crops come under a different order and their use is generally permitted; in consequence, a number of people who have not specialized in vegetable growing under glass before, are doing so now, rather than have the houses empty and unused. But it is sad to see tomatoes



FIG. 84. A bomb crater planted with waterlilies.

flourishing where once the orchids and cacti grew.

On the larger scale the nurserymen are doing their best to produce useful crops; by law, a considerable proportion of their ground must be given up to vegetables. And many open spaces, meadow land and parks, where formerly little grew but grass between fine trees, now support their acres of potatoes, cabbages and Brussels sprouts.

A good deal of damage was done at first by enemy action. There is an old proverb concerning the appropriate behavior of those who live in glass houses; if the throwing of stones is dangerous, what about the dropping of bombs. Even the shell splinters from the protecting guns can damage a glass roof; but owners have become ingenious in dealing with small damages. Bomb craters too are rather disturbing to an orderly garden, but even these are taken philosophically; one friend reported that "Hitler has made me a new rock garden." And at least one bomb crater that became filled with water has been made beautiful by the planting of waterlilies (Fig. 84). Where town property has been destroyed on a large scale, ready hands have dug the soil so well that many a damaged city site now grows vegetables where till recently offices stood.

As has been said, much of our vegetable supply used formerly to come from abroad; and so, too, did our supply of vegetable seeds. There were various reasons for this, one important one being that, though our climate permits the growing of certain plants to useful maturity, our season is not long enough to ripen the seeds satisfactorily. Also harvesting the seed crops takes time and labour which is not always available for the proper treatment of those which we can grow. There is, in consequence, a shortage of some varieties but there is no general shortage of seeds; everyone can be sure of getting enough to produce sufficient vegetables for his family's needs—and for very material assistance in this direction we have to thank our cousins and allies across the Atlantic.

Fertilizers too are in short supply, but the sale of 'complete fertilizers,' properly mixed by an expert, instead of the raw materials, greatly helps the small grower, and the value of humus is being properly appreciated, so that the making of a compost heap from every scrap of garden refuse is becoming the ordinary routine of garden and allotment.

Does all this mean a serious set-back for horticulture in this country? We hope not. Shortage of staff has meant a great reduction in the propagation of ornamental plants; stocks everywhere are greatly reduced, but private and

professional growers alike are trying to keep a small reserve which takes—and indeed can get—but little attention now; but if these reserves can be brought safely through to the days of peace, they will make a useful starting point from which supplies can be worked up again.

Much we are losing, much we may never regain; but the spirit of horticulture, while adapting itself to the times, is as strong as ever—or stronger.

#### FROM NEW YORK STATE

You asked how I heated my glasshouse, pictured on page 127, Vol. XV. Well, I have a small stove. It only takes from 1 to 2 small shovels full of coal to keep it going. Last year I only used  $\frac{3}{4}$  of a ton of coal and we had a very cold winter. I have never had any cacti freeze. Last year the temperature was about 18° below and I only lost an ivy plant which I left too close to the window.

I have my small stove in the north west corner of the greenhouse. Around the east, south and most of the west side are benches in which I keep my plants. I also have 3 small window shelves on the east side in which I put all my small seedlings.

I have never had any luck in raising cacti from seeds. I guess I am not patient enough. I do have wonderful luck with offsets. All of my nicest little plants are ones I grew myself, from the older plants I bought.

Most of my collection are of the smaller globular types. I seem to have the best luck with them. I don't think I have lost any of this kind.

The soil I used is my own personal mixture. I use a mixture of sand, which is quite coarse, good garden soil and a little rich soil which my father mixes. I think the secret of my luck with plants is the loose porous soil. I also have a special routine in watering which I have followed the last three years. I water them on Sundays in the winter time; and on Sundays and Wednesdays in the summer. When I say water I don't mean drown them. I give them just enough to wet them and no more. In the spring when they begin to show signs of growth I do give them a rather good soaking on Sundays. I try to keep them on the dry side, and I have had some nice blooms for my work.

In the summer I have to put a coat of whitewash on the glass to keep out the strong sun. I have found out that quite a few of my plants do not like the strong sunshine. I keep all of my orchid cacti and *Rhipsalis* under the benches in the summer. They get just enough sun in the late afternoon when the long rays of the sun hits under the last benches.

I have enjoyed "Cacti for the Amateur" very much. It was from that book that I got my idea for my glasshouse. I have only had one near success with grafting, and that wasn't perfect. I am going to try again next spring.

I have five different kinds of *Stapelia*s. They have always bloomed in the fall. I had one which looked like a small balloon and when it opened it was 14 inches across. It was quite a sight.

MARYELLEN MARTIN, New York.

Due to an inadvertent error the name of the beautiful garden of H. Basil Christian, Esq., in So. Rhodesia was misspelled in the last issue of the JOURNAL, the name is "Ewanrigg."

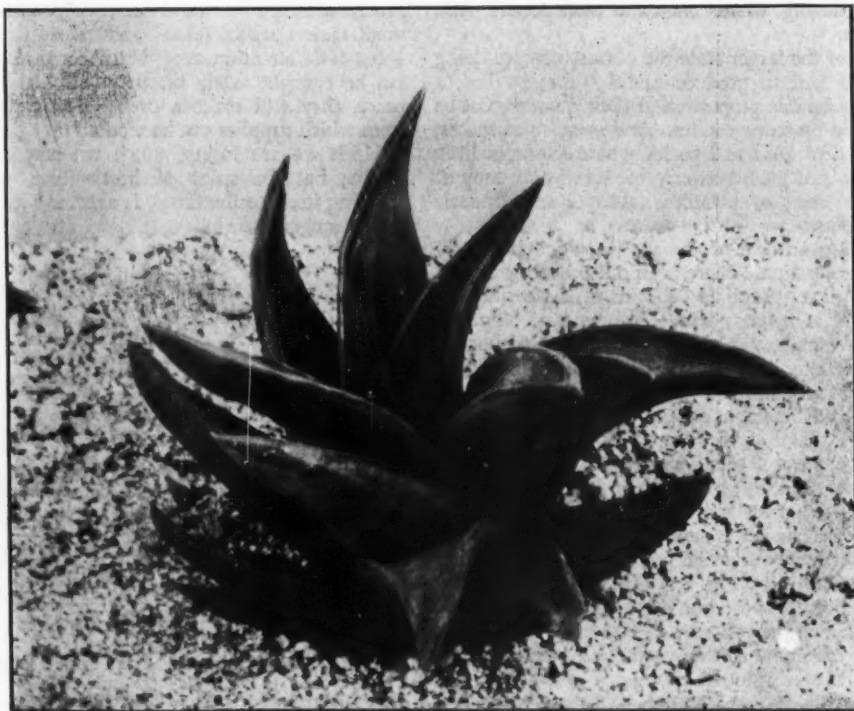


FIG. 85. *Haworthia Lateganae*, Poelln., nat size.

## Notes on Haworthias

By J. R. BROWN

*Haworthia Lateganae*, Poelln. in Desert Plt. Life IX (1937) 103, in Repert. Sp. Nov. XLIII (1938) 99.

Plant with a short stem, 9-10 cm. in diam., with numerous spirally arranged leaves.

Leaves ovate-lanceolate, falcate, long acuminate and terminated with a small, pungent, somewhat pellucid, later becoming brownish point, 5-6 cm. long, 1.5-2.5 cm. wide towards the base, very minutely rugulose and of a gray-green color, face of leaves excavate, back rounded and obliquely keeled, the margins and keel in the upper part thickened and somewhat shining.

Type Locality: Van Wykskraal, Oudtshoorn Distr.

Named for the discoverer, Mrs. L. Lategan.

*Haw. Lateganae* is closely related to *Haw.*

*Starkiana*, Poelln. but is distinct by its taller habit, grey-green color, more falcate, more deeply excavate and more acuminate leaves. The upper part of the leaves are often in a more or less horizontal position. The inflorescence closely resembles that of *Haw. Starkiana*. Peduncle, including the raceme, 45 cm. and more tall, slender, simple or branched; pedicels 4-5 mm. long, bracts about half as long, thin and somewhat inconspicuous except for the brown keels; perianth 15-16 mm. long, erect-spreading, the narrow, obclavate tube pale greenish-white, lower segments very recurved, the upper segments more erect, white, green lined.

*Haw. Lateganae*, of the sect. *Scabrae*, Berger flowers in So. California during Aug. and Sept.

The photos. illustrating this *Haworthia* and *Haw Starkiana*, show plants of the same size and approximately of the same age.

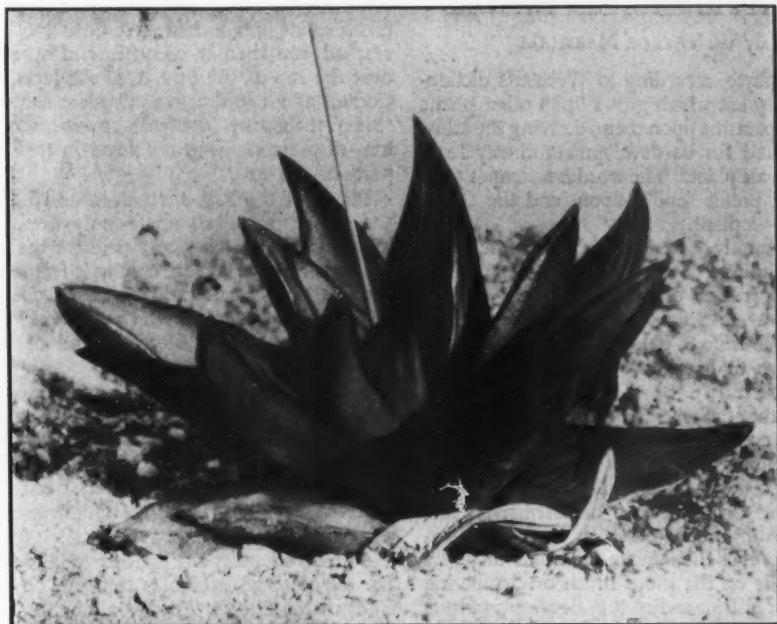


FIG. 86. *Haworthia Starkiana*, Poelln., nat. size.

#### HARDY CACTI IN ILLINOIS

In the summer of 1942 I prepared a new bed to further my experiments with hardy cacti or those of supposed hardiness. I did not plan this bed on an elaborate scale but so that each year I can add to it. After drawing up plans for this bed, I dug up sod and dirt to a depth of one foot. For the border or edges I used the same native porous limestone rock that I use for my large cactus garden; some of our local rockhounds call it petrified moss. Anyway it is very fantastic in shapes and designs and many contain imprints of leaves. The next task was mixing the dirt; our native *Opuntia compressa* does wonderfully well in a reddish heavy sand but with any other types of soil it suffers. So many pails of this dirt or heavy sand were brought in and mixed with some garden loam and charcoal. When filled, the soil level was 2 inches above the lawn level.

The bed was divided into sections as follows: one for Wisconsin, Illinois, Indiana, Wyoming, Kansas, Arkansas, Utah, Colorado—all *Opuntias* except the last state named.

Our fall, winter and spring were of the freakiest variety, as we suffered with an unseasonable freeze the 24th of September, followed with a heavy snowstorm the 25th. October was cold and wet, our entire winter was of the same variety. The day after Thanksgiving a heavy wet snow fell and stayed on until March (of course many other snowstorms and ice storms). The coldest weather here was 19 below zero. We have had colder winters but not of such a length as this one.

Here are the results: *Opuntia fragilis* from Wisconsin and Kansas not a pad lost, *O. compressa* from Illinois and Indiana O.K. *Opuntia polyacantha* from Wyoming O.K. *Opuntia* from western Kansas partly killed. *Opuntia* from near Little Rock, Arkansas all killed but a couple pads. *Opuntia basilaris* var. *anrea*

from Utah O.K. *Opuntia refinesquei* from Wisconsin O.K., and *Opuntia* from Iowa. From Colorado the following survived and were undamaged: *Opuntia polyacantha*, *rhodantha humifusa*, *Pediocactus simpsonii*, *Echinocereus gonacanthus* and *caespitosus*. *Pediocactus simpsonii* bloomed for me, also *Echinocereus gonacanthus* and *caespitosus*, the last named was almost a beautiful dark purple bloom. *Opuntia humifusa* is now budded.

The following did not survive: *Opuntia davisii*, *Echinocereus aggregatus* and the growing tips of *Echinocereus viridiflorus* were killed and with our unusually wet and cold spring it finally rotted in May. The last named was a surprise as one from northern New Mexico has wintered successfully for the years 1939-40-41-42 and bloomed every spring. I am of the opinion it was not thoroughly established as it was transplanted in August and started a new growth in September. Up to the 24th of September we enjoyed beautiful summer weather which with warm rains combined, induced new growth on most cacti.

*Coryphantha vivipara* from Colorado also wintered O.K. I have two clusters of same from western Kansas that have wintered O.K. since 1938. *Neobesseya missouriensis* from Oklahoma has also wintered O.K. and bloomed each spring.

These cacti were covered with snow for three months—December, January, and February. I am very proud of my hardy bed of cacti and for the year 1943 I intend to try at least two dozen more cacti for hardiness. I am sure that with proper soil and with a raised bed for good drainage that it will be possible for us in the north and especially in the cold zone to enjoy about two dozen kinds of cacti the year around. If one has a bad case of Cactitis with limited time and space, especially winter space or lack of greenhouse, this knowledge will be of tremendous value.

PROF. ARTHUR BLOCHER, Amboy, Illinois, June, 1943.



## EPIPHYTIC CACTI IN NATURE

By W. TAYLOR MARSHALL

An epiphyte, according to Webster's dictionary, is "A plant which grows upon other plants but is not parasitic upon them, deriving the moisture required for its development chiefly from the air; an air plant." The word is a composite of the Greek prefix "epi"—upon, and the Greek "phyton"—a plant.

In the family Cactaceae three sub-tribes are mainly epiphytes. Sub-tribe 2, HYLOCEREANAE contains 9 genera of 53 species, Sub-tribe 7, EPIPHYLLANAE contains 8 genera with 26 species and Sub-tribe 8, RHIPSALIDANAE contains 8 genera with 69 species—a total of 148 species of epiphytic cacti.

All of these species are native to the tropics except a few species of *Rhipsalis* which range into sub-tropic regions. Most species are indigenous to the tropical rain forests but sometimes plants of *Hylocereus* or *Selenicereus* are found growing in the desert or semi-desert sections adjacent to the rain forests where they may be epiphytic on the thorn brush or clambering on rocks or hillsides when they develop a normal root system.

In the tropical rain forests species of *Hylocereus* and *Selenicereus* and their allies start from the seeds of fruits dropped from the trees and almost as soon as they germinate the seedlings grow in the direction of the nearest tree trunk into which they climb. When the plant has reached a length of three or four feet up the trunk of the tree they start to depend on the moisture received through their air roots and soon break all ground connection and live entirely on the food and moisture supplied by the air roots which have a special absorbent epidermis to take in food and water as obtainable. These specialized roots are common to the orchids, cacti and all epiphytic plants.

In the rain forests of the tropics I visited, the trees are closely spaced and reach great heights with spreading top branches to make a solid umbrella which cuts most of the sun-light leaving a semi-darkness at their base which hardly gives sufficient light to the explorer to enable him to avoid the tangled mass of rope-like vanilla vines and similar undergrowth. In the West Indies the surface of the ground, which is of coral origin, is pitted with blow holes of uncertain depth which makes travel in the semi-gloom treacherous in the extreme.

Naturally no plant can long survive in this humid darkness, so the plants which germinate on the ground strive to ascend to the tree tops for the light which is necessary to normal growth. All of the cacti react in this way.

Usually a *Hylocereus* or *Selenicereus* will climb as an unbranched stem until the light is reached and then it branches and spreads all over the top of the host tree. At Jamaica, the Curator of Hope Botanical Gardens showed me several mahogany trees with an estimated three tons of *Selinicereus grandiflorus* in their upper portions.

Plants of the RHIPSALIDANAE and EPIPHYLLANAE seem to germinate only from seeds caught in the crotches of trees near the top of the tree. Such plants are epiphytic from infancy and in age reach tremendous size. Several plants of *Rhipsalis cassutha* which I observed had branches pendent to fifty feet and of an immense weight.

As a consequence of their position, the admirable flowers of the *Hylocerei* and *Selenicerei* are seldom seen by travellers in the rain forests although they are frequently seen in the brush of the desert sections. However, I have never observed plants of the RHIPSALIDANAE in these drier sections.

I observed only one species of *Epiphyllum* (*E. oxypetalum*) which is common on the islands of the Greater Antilles although not very plentiful in any district I visited. I am told that this plant is of typical habit with other species of this genus. It also germinates its seeds in tree crotches or depressions and the branches are mostly pendent, sometimes reaching ten feet in length.

As the host trees are from 40 to 60 feet tall and the *Epiphyllums* are found near the top where light can be obtained, the plants are hard to locate or to photograph from the ground.

Many large clumps of Bromeliads are also epiphytic on these same trees and each clump houses a colony of large red ants which swarm over invaders and bite unmercifully, thus preventing access to the tree tops to all but the bravest. On several occasions when I have sent natives up into these trees for plants the ants attacked so viciously as to beguile their victim to fight them off with both hands resulting in a long fall from which they always emerged without harm due to an instinctive cat-like ability to light on all fours.

*Vanilla planifolia* or a related species is common in these rain forests. This Orchid forms very long rope-like stems looped from low branches and in tangled mats on the ground which seem to possess the constriction ability of a python. The perfumed flowers are in axillary racemes usually high above the ground. The vanilla of commerce is extracted from the seeds.

Orchids of the genera *Dendrobium*, *Odonoglossum*, *Oncidium* and others, find a home

on the same host trees greatly adding to the interest of a botanizing trip through these forests.

The Islands of the West Indies and the Central American mainland are tropical and rainfall of 100 to 200 inches a year is usual but on each of the Islands and in sections of the mainland, mountains of 3000 feet or more cut off the rain clouds which always come from the one direction of the prevailing winds leaving semi-arid sections in their lee.

The districts so cut off from most of the rain clouds may have a rainfall of from 10 to 30 inches annually and vegetation there is limited to xerophytes. The most common thorn bush is *Parkinsonia aculeata*, the "palo-verde" of the American arid districts. Species of *Pilocereus*, *Lemaireocereus*, *Harrisia*, *Melocactus*, *Mammillaria* and *Opuntia* inhabit these districts.

Several monotypic genera, *Dendrocereus*, *Neoaabbottia*, etc., are also found in restricted localities and species of *Leptocereus* inhabit the three large Islands of Cuba, Hispanola and Puerto Rico.

In these districts species of *Selenicereus* and *Hylocereus* and possibly of *Rhipsalis*, although I have not observed it, are found but here they largely lose their epiphytic habit and sprawl over rocks or climb into the thorn bush but they are always nourished from ground roots.

The genus *Consolea* is endemic to these Islands and species of this genus extend into the moister sections although primarily they are dwellers of the arid district.

Temperatures in the West Indies vary only about 20 degrees throughout the year. A low of 65 degrees to a high 85 degrees Fahrenheit is usual.

I first encountered the epiphytic cacti near

Puerto Plata in the Dominican Republic, a city on the north coast of Hispanola, observing three species of *Hylocereus*, three species of *Selenicereus*, *Rhipsalis cassutha* and *Epiphyllum oxypetalum* in the first hour after entering the rain forest.

Going south from Puerto Plata the rain forests occupy the coastal plain which rises from sea-level to a height of 3000 feet at Mount Isabella, eight or nine miles inland. As one scales the steep mountain side the tall trees are more widely spaced and tree ferns appear and these toward the top, constitute the principal vegetation. Orchids, Bromeliads and epiphytic cacti are found all the way to the summit but there an abrupt change of flora is encountered. At the very top of the ridge of the mountain one can look to the north over tree ferns and dense forest to the blue Atlantic Ocean, a truly inspiring landscape. The south slopes of the mountain which are cut off from the rain clouds carried by the prevailing winds, are arid wastes in which the tallest trees are *Lemaireocereus bistris* which extend above the thorn bush. I feel sure that nowhere else but in the West Indies and Central America can such a sharp contrast of vegetation be observed.

This arid section extends south to the Caribbean Coast for about eighty miles but is only about thirty miles wide. The country to the east and west of this strip receives ample rains and here sugar, tobacco, bananas, cocoa, coconuts, and numerous tropical fruits flourish on the plains while coffee is grown on the hill-sides. Similar sections are found on most of the islands of the West Indies and Central America always in the lee of a tall mountain or mountain range and never constituting an important percentage of the area of the island.

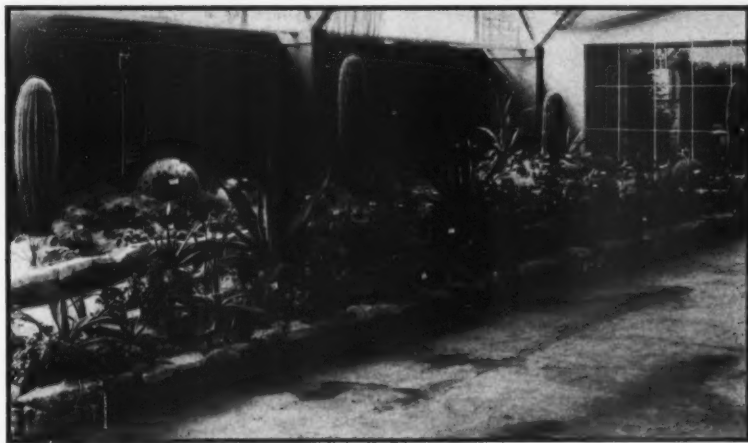


FIG. 87. An ideal exhibit of the Chicago Cactus Society. Such displays are recommended to keep up the ever growing interest in succulents.

## ON COMMENTS ABOUT NOMENCLATURE

By LEON CROIZAT

A crop of comments is gathering upon my desk as a result of the publication of the articles I have so far written on nomenclature. Some of these comments are interesting, and I will make it a point to discuss them for my own benefit and that of their writers.

A correspondent writes: "You insist on the binding character of the Rules, but is it not true that the Congresses have disregarded their own decisions and placed many genera and species in the so-called *nomina conservanda*? *Mammillaria* has been accepted as such regardless of the existence in the record of an earlier Alga by that name. Why not keep up *Stenocactus* and *Binghamia* if we like it?"

These statements reveal a misconception which is unfortunately widespread. Many seem to believe that the Rules of Nomenclature are some brand of soda which can be drunk when one is thirsty, and turned aside when one does not feel like sipping it. I will have reason to enter the vitals of this notion at a later time. Here I state this much: the Congresses did not "disregard their own decisions" at all in preserving certain names. They put into the book of the Rules an Article which reads as follows (Art. 21, Amsterdam Code): "... To avoid disadvantageous changes in the nomenclature of genera by the strict application of the Rules of Nomenclature, and especially of the principle of priority ... the Rules provide a list of names which must be retained as exceptions. These names are by preference those which have come into general use in the fifty years following their publication, or which have been used in monographs and important floristic works up to the year 1890." The same exception was granted for certain names of families by Art. 23 (1) and (2).

Naturally, having written these Articles in the Rules, the Congresses do not disregard their own law when they keep up certain names. They stand within this law. It would not occur to a chess player to state that the game violates its own rules by allowing the peculiar motions of castling, breaking by these motions the usual run of movements allowed to the king and to the rook. A chess player knows that castling is fully within the rules of chess, although it is being allowed as an exception. Precisely in the same spirit, the Congresses have made a law whereby it is permissible to keep up as good, certain names which are admittedly bad. It is a gross misconception, consequently, to speak of the Congresses' "having disregarded their own

decisions," and to draw from this misconception the implicit conclusion that since the Congresses have seemingly played fast and loose any student of plants can do the same.

*Mammillaria* was published by Haworth in 1812, and remained unchallenged for over a century. It is quite consistent with the dicta of Art. 21 that this name should have been kept when it was discovered by Britton & Rose that there existed a *Mammillaria* published by Stackhouse in 1809 for an Alga. One century of constant use is legitimate ground for an exception in favor of *Mammillaria*, as everybody will agree. *Rhipsalis* is another genus of the Cactaceae which, unknown to most, has been preserved against *Hariota*, which, consequently, cannot be legitimately used. *Rhipsalis*, too, had been in use for over seventy-five years when it was conserved. No other cactaceous genus, so far as I know, is now listed among the "nomina generica conservanda." Werdermann has proposed (in *Kakteenk.*, 129-130. 1937) that *Pilocereus* is maintained together with *Cephalocereus*, which is understandable, considering that rejection of these names would call for the publication of many new species, with a serious disturbance of existing nomenclature. *Pilocereus* and *Cephalocereus* have been in use for at least fifty years, which gives them a clear title to consideration under Article 21.

Altogether different is the case with *Binghamia*, and with *Stenocactus*. *Binghamia*, the cactus, was published only in 1920 on a type-species which is known to be a mixture, and for the last ten years it has been a subject of controversy, while being constantly used for an Alga. The extent of the controversy to which the use of the name *Binghamia*, the cactus, has given rise is documented by the articles of Werdermann (in *Kakteenk.*, 21-36-49. 1937) and of Bullock (in *Kew Bull.*, 454. 1938). Backeberg & Knuth, meanwhile, have retained the name in a special sense (*Kakt.-ABC*, 195. 1935), and used *Haageocereus* in another (op. cit., 207) for some of the species treated by Werdermann and Bullock under *Binghamia*. In conclusion, the confusion is much greater around *Binghamia*, the cactus, than around *Binghamia*, the alga, and I cannot see a reason why *Binghamia*, the cactus, should be retained as a *nomen conservandum*. After all, exceptions are granted when there is ground for granting them, not because it so happens that some name has been current five or ten years, and only to an extent, in place of another. If Art. 21 is abused—and the American botanists who voted against it feared it would—there is no end in sight to "nomina conservanda" created on the flimsiest pretexts. I believe in this Article, but with reason: let the Rules take

their course in normal cases, reserving the application of Art. 21 to extreme instances, as the Rules themselves say.

As to *Stenocactus*, nothing needs to be stated. When Berger proposed this name, *Echinofossulocactus* stood legitimately in the record. In addition, Berger proposed it as an alternative and invalid name, and it is a moot question who is the author to whom the paternity of *Stenocactus* must be credited. To propose such a "genus" as this as a *nomen conservandum* is to me unthinkable, to say the very least. The fact that some authors have been misled into accepting this tainted name, is no reason why it should be forced upon all botanists, plaguing them with no end of controversies and doubts about its authorship and synonymy.

A last remark has its place here: a name cannot be used as "conservandum" until and un-

less a legitimate case is made for its maintenance as such. It means very little that somebody believes that *Stenocactus*, for instance, ought to be maintained. This somebody must undertake to prove his case, and to write a statement in which the reasons for the maintenance of the name are stated. Such a statement must be put into print and forwarded to the Committee that decides on nomenclatural issues. After the Congress has acted favorably upon the proposal, the name can be used with full legitimacy.

In conclusion: what one thinks, believes or says about the Rules means nothing against what the Rules themselves say. This is worth keeping in mind, for there can be no order there where everybody takes the law into his hands and utters oracular decisions or pious wishes, without making a precise reference to what is written into the Rules.

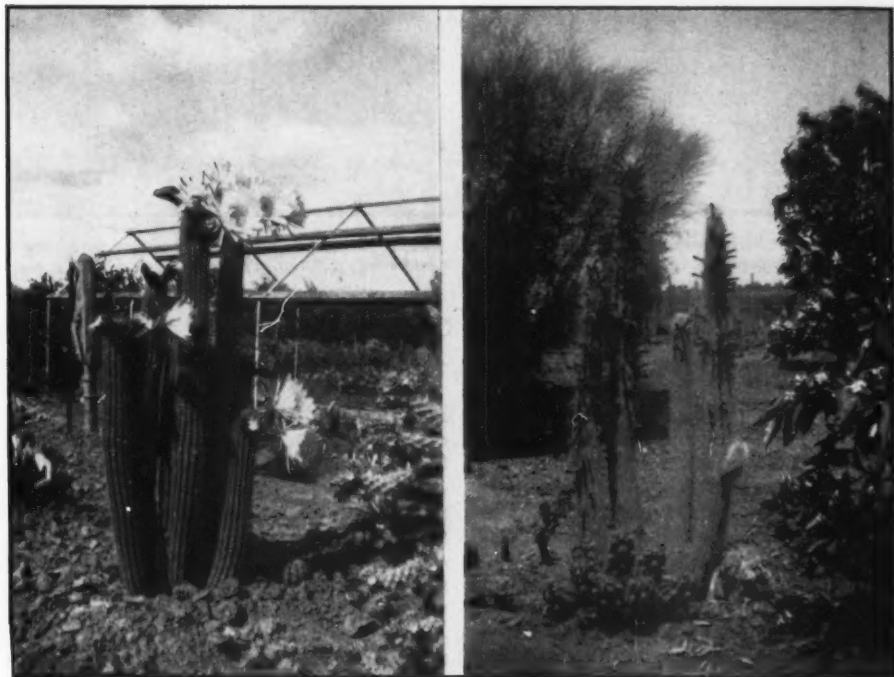


FIG. 88

From Ralph W. Field, Victoria, Australia: "Despite the war our common interest continues ahead by leaps and bounds. We are, of course, very much restricted with the elimination of imports for the time being but there is quite a lot of material in the country and new dealers are springing up and bringing cacti before the public." For instance, Mr. Field's father was growing cacti thirty years ago which accounts for some of the large plants that are now producing abundance of seeds. Mr. Field has followed in his father's footsteps and has an enviable collection. Picture shows *Trichocereus spachianus* (left) and *Cleistanthus strausii* (right).

The structure in the background shown in Fig. 88 (left) is a frame constructed of piping connected with 3x1 battens. This shelter is for tender plants and in late autumn three-eighth inch cement sheets are placed to form an ample roof. The sides are left open.

Mr. Field concludes his letter with, "Some time ago it was heartening to get your note with a hint at the general feeling in the U. S. A. regarding Australia. About that time we were greatly cheered too, listening to your President's speech."



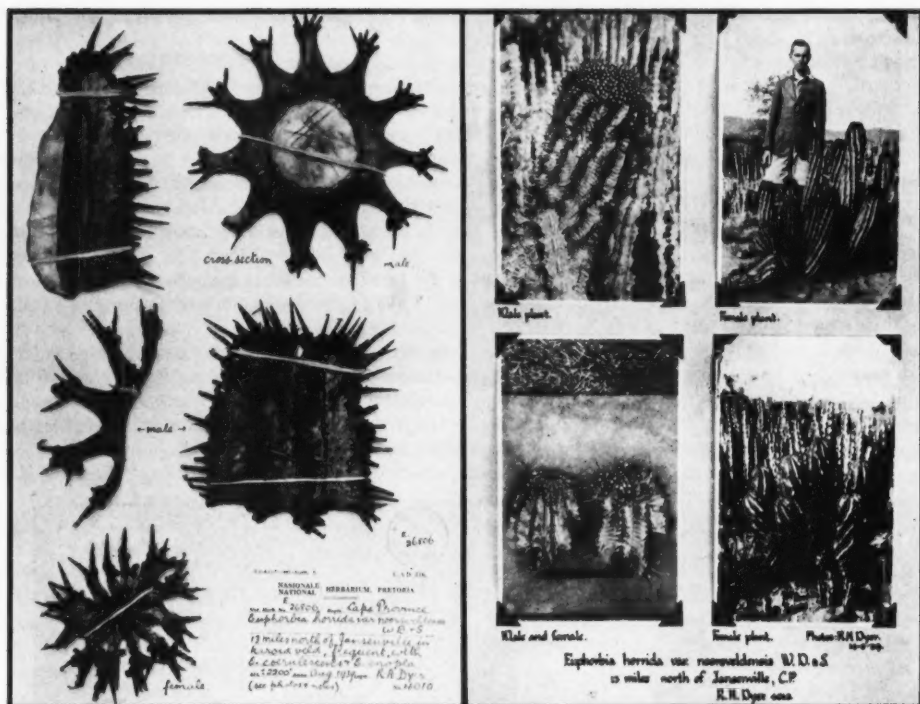


FIG. 89. LEFT: Herbarium sheet of mounted specimens. RIGHT: Supplementary sheet of photos pertaining to the same plant but filed in cabinets adjoining the herbarium material. Photos by R. A. Dyer.

## PRESERVATION OF SUCCULENT MATERIAL

By R. A. DYER

The article on the "Preservation of Cactus Material" by R. H. Peebles in this JOURNAL, January, 1942, page 3, interested me and I feel it must have interested many other readers also. On this assumption it is thought that further information on succulents, other than cacti, may be appreciated.

Most of the advice given by Mr. Peebles—on collecting complete material; on the value of photographic records; on collecting equipment; on the necessity of a garden for the cultivation of specimens; on the preparation of specimens for incorporation in a herbarium, and other details—could be adopted or adapted for succulents in general. Mr. Peebles says this in the last paragraph of his article. But at the outset he informs the reader that other methods can be used to accomplish similar results.

At the National Herbarium, Pretoria, (later referred to as N.H.P.) we deal with relatively few cacti but there is a fairly regular inflow of indigenous succulents. From time to time ab-

normally large quantities of South African succulents arrive for classification and preservation. Perhaps the peak was reached when Mr. G. W. Reynolds found the study of Aloes an interesting hobby and scoured the countryside for typical specimens and as much information as possible. Mainly due to his untiring energies the N.H.P. can now claim with justification to contain the best collection of South African Aloes in the world. Another rush period occurred during the collection of material for the records now published in "The Succulent Euphorbiae."

The fundamental difference between the preparation of herbarium specimens from succulent and herbaceous or woody plants, is that the latter die soon after plucking and lose their moisture readily, whereas untreated succulents do not die readily and give up their moisture tardily, shrinking and often becoming distorted in the process, or even continuing to grow in the drying press. Mr. Peebles mentions the vitality



of the *Crassulaceae*. A specimen which the present writer examined in a world famous herbarium had continued to grow after being filed for more than two years. Species of *Anacampseros* are capable of performing similar feats of endurance. Special treatment of succulents intended for herbarium records is essential. The treatment aims at killing the living tissue and extracting the moisture with the least amount of distortion. Cutting bulky specimens longitudinally is often unavoidable and generally beneficial to the final result. Cross-sections are often of particular value in enabling later workers to visualize the character of the living plant.

We now arrive at the main point of this article which is the all important method of killing at the N.H.P. It is an old method and a successful one—the immersion of the succulents in a 5% solution of formalin for about 24 hours. A little latitude in time does not usually matter materially. The method has its limitations with *cacti* though, for the liquid soon becomes objectionably mucilaginous and this is probably why it was not even mentioned by Mr. Peebles. But for succulents other than *cacti* it generally works well.

For small specimens, glass cylinders holding 3-5 litres may be used. Each herbarium assistant has one of these close at hand. When bulky succulents or large quantities of small ones have to be dealt with at one time, the community jar has to be used. This is a porcelain barrel with a capacity of about 50 gallons. It is usually kept about  $\frac{1}{3}$  full of the 5% formalin solution, but the volume can of course be increased according to requirements. Delicate flowers are not immersed if it can be avoided as they are liable to become soft and difficult to handle. Fortunately, though, few succulents have really delicate flowers which cannot stand the formalin treatment. Such items as *Aloe* inflorescences give very satisfactory results. Untreated inflorescences are liable to shed most of the flowers before they are dried, pressed and ready for the herbarium, whereas the treated inflorescence retains all the flowers and dries comparatively quickly.

It may often be beneficial to cut bulky spikes or dense racemes longitudinally. The leaves of *Aloe* species dry well after being placed in formalin solution, but it was found that the markings on the leaves, especially in the 'maculate' group, tend to become indistinct. For this reason these *Aloe* leaves with markings are no longer placed in the bath. With them and other very fleshy types, better results are obtained by cutting the leaves lengthwise separating top and bottom surfaces and removing most of the soft jelly-like centre. The 'skin' should not be

scraped too thin as it becomes very brittle on drying and is then readily damaged both before and after mounting. When dealing with *Aloe* leaves an alternative tip given by Mr. P. J. Greenway of Amani Research Station, Tanganyika Territory, may appeal to some workers. The central portion of the leaf is cut away and discarded while only the margin is retained. In order to record the shape of the leaf, cross-section impressions are made on herbarium or other recording sheets.

Mr. Peebles mentions ways and means of accelerating the drying of succulents after treatment. At the N.H.P. they are placed in an electrically heated chamber large enough to accommodate a plant press 18 in. long, 11 in. wide and 12 in. deep. The lid which is constructed from an old-fashioned letter press is used to exert pressure on the specimens and is made almost completely airtight by means of rubber fittings. The drying chamber is fitted also with an exhaust fan which draws the hot air at a controlled temperature through the specimens, thus accelerating drying according to requirements. It may be necessary to keep specimens 2-3 working days in the drying chamber to get the best results: that is, the plants should not be overheated in an effort to dry them quickly. If more than one day in the drying chamber is necessary it is advisable to change the drying paper before the press is heated each day.

After the specimens are dry they are poisoned. This is done to prevent injury by insect attack, mainly by the minute "herbarium beetle." The poison solution is made up as follows: 3 oz. mercuric chloride and  $1\frac{1}{2}$  oz. carbolic acid crystals per 1 gallon commercial alcohol (96%). Specimens are immersed in this for several seconds to allow the solution to penetrate, and are then placed between absorbent paper. The alcohol soon evaporates leaving a film of poison on the specimen. Specimens of *Euphorbia* are particularly susceptible to insect attack.

The process of mounting the specimens for incorporation in the N.H.P. is much as described by Mr. Peebles. The specimen is first glued to the herbarium sheet. The heavy portions are then stitched to the sheet by means of raffia, the exposed ends of which at the back of the sheets are covered by gummed paper. Strips of gummed paper are also used for securing the more delicate parts of the plant to the sheet. In the case of large specimens it may be necessary to make more than one herbarium sheet and in rare cases even three or four. Perfection is a good ambition.

The usual complaint about herbarium specimens of succulent plants is that they do not give a true picture of the living plant. Any aid to

overcome this must be made use of. The importance of photography has been mentioned. The preservation of essential organs, flowers or complete plants in a liquid preservative is another means. This is particularly beneficial in the study of such groups as the *Stapelieae* in which the structure is not suitably restored for examination by the usual hot water treatment. The following formula has been used with fairly satisfactory results although the partial loss of colour cannot always be avoided:

Formalin 40%.....	50 c.c.
Alcohol (Commercial 96%).....	50 c.c.
Glycerine 1.26 sp. gr.....	10 c.c.
Distilled water.....	400 c.c.
Copper chloride or sulphate.....	1 gr.

The glycerine keeps the specimen pliable and moist when it is removed from the solution for examination; copper chloride or sulphate aids the retention of green coloration.

If I may be allowed a few more lines I should like to refer to the question of mounting photographs. At the N.H.P. photographs are never mounted on the same sheet as the herbarium

specimen in case of damage to the print from the residue of the poison solution. The photos are mounted on separate sheets by means of "corners" and if economy of space or material does not prevent it, the sheets with photographs are placed in separate covers adjoining the relative herbarium material. In some other institutions the collection of illustrations is sometimes kept quite apart from the specimens.

Most of the above information is based on procedure at the National Herbarium, Pretoria. It is intended as a supplementary article to that by Mr. Peebles but even so does not pretend to exhaust the subject.

NOTE: Mr. Peebles sends this interesting note from Dr. Carl Epling, professor of botany at the University of California at Los Angeles, who replied with a suggestion: "... if the flower be cut longitudinally and *only the ovary* dipped into boiling water for three or four minutes the whole can then be pressed with unusual success, preserving a large proportion of the original color. If the whole flower is dipped in the boiling water one has nothing but a mess."

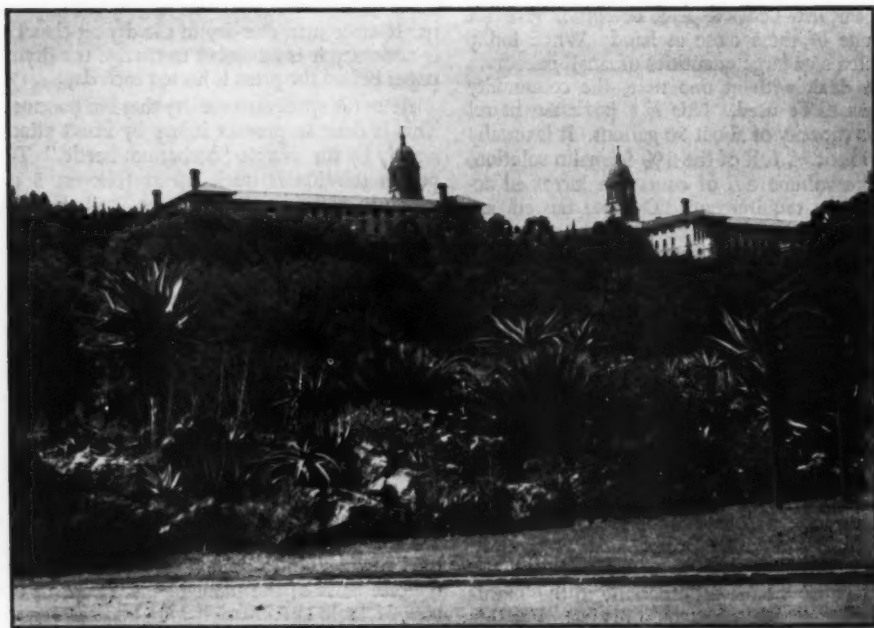


FIG. 90. Entrance to Division of Botany and Plant Pathology, Pretoria, South Africa, with the "Union Buildings" in the background.

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## THE HYBOCACTUS

A translation from "Cactus" Vol. 7, No. 6, the Belgium magazine. By Mr. L. Albrecht.

### *Gymnocalycium* and *Neoporteria*

These two genera of the Subtribe ECHINOCACTANAE are very prevalent in the homes of amateurs and much appreciated by them. The ones most abundantly represented are from the genus, *Gymnocalycium*, esteemed for their excellent hardiness, the ease with which they reach maturity, their unique swollen convolutions, and above all, for their constant abundance of flowers; the others, *Neoporteria*, are highly sought for their rarity, their spiny appearance and their beautiful dark coloring.

The term, "Hybocactus," now seldom used, is of ancient classification. It has been used by Prince Salm-Dyck under the term, "Hybogonia." The two words are derived from the word "Hybos," which means "hump."

There are some Echinocactanae whose sides are clearly divided into individual tubercles by the presence of a special form of swelling underneath the areoles from a second hump of variable shape, usually accented and bounded in the lower part, by a well-marked transverse furrow. Before *Gymnocalycium* and *Neoporteria* of the modern classification, Salm-Dyck and K. Schumann considered the plants as *Echinocactus* but later classification place them in separate genera.

Besides this common character of tubercle form, the Hybocacti have a unique, geographical tie, which is their exclusive South American origin: *Gymnocalycium* from Argentina and Brazil; *Neoporteria* from Chile. These two sources are not their only differences. Those of Chile have the ovary and tube of flower protected by the hairs which are matted together by needle-like bristles surrounding the scales. The Argentinas are not protected; they have only some naked scales, relatively few in number, thick and fleshy without hairy covering—from this nudity they come by the name of *Gymnocalycium*, meaning "naked calyx."

The coloring of the flowers is white, shading toward cream or to clear rosy flesh in the family of *Gymnocalycium*. On the contrary, in the genus *Neoporteria*, the blossoms are a deeper reddish or yellow, the color often appearing a little pale and faded.

Authors have placed *Gymnocalycium* under *Piptanthocereus*, and *Neoporteria* under *Trichocereus*, and the lineage is still very problematical. Backeberg has farther divided them into *Erianthi* (flowers armed with spines or hairy covering) and *Gymnanthi* (naked flowers).



FIG. 91. A group of *Gymnocalyciums*.

They have been in European collections since 1830 and it is in the collections they have been studied and not in their place of origin. Often they have been described before their flowers and fruit were known. Each described the plant in his collection as a new species and thus has come a considerable confusion in names. In the genus *Gymnocalycium*, culture and hybridization have created many varieties. Schelle knew eleven varieties of *G. gibbosum* and fifteen varieties of *G. denudatum*; the slightest difference caused the introduction of a new name. As before stated, there have been many from hybridization, in culture. Backeberg is of the opinion that there have been natural hybridizations in their original habitat, and adds that the genus is not yet well described because of varying localities. We add that the descriptions are all very insufficient, especially concerning the exact form of the lower protuberance under the areole, which is not very definite, just as are those of the transversal furrows which determine its lower border. For this reason, it is very difficult to recognize some of the plants by their vague descriptions. It is necessary to add that the culture in collections can modify, in an important way, the aspect of the same plant: the dryness, the humidity, and



FIG. 92. *Neoporteria nidus*. . Photographed by Haselton in R. W. Kelly's garden.

the richness of the soil, having marked effect.

To guide in this confusion which applies especially to *Gymnocalycium*s, the method of classification by K. Schumann is one of the easiest to use in its comprehensive lines.

#### NEOPORTERIA

In a good many ways this genus is similar to *Gymnocalycium*, especially in the general structure of the tubercle which has been one of the chief characteristics outside of its geographical location (Chile exclusively). The protection of the flowers, tube and the ovary is by means of more narrow scales whose axils are filled with a felt lining of long, smooth wool, entanglement of stiff bristles, hairs or flexible spines.

The fruit bursts open from the base at maturity. Flowers are funnel-shaped and with a more marked color, reddish into yellow with the stamens projecting beyond the flower. The style and stigma are in general more deeply colored than those of *Gymnocalycium*, but the stamens are the same general color as the inner petals. These flowers are also not as long (two inches or more) and they have a shorter tube. [Two or more flowers are frequently produced from a single areole—W. T. M.]

The dimensions of the body are smaller than the *Gymnocalycium*s, generally 2 inches in diameter and most frequently the form is elongated oval. The skin, like the spines, is dark and ranges from dark olive-green to dark gray-green and almost black, also sometimes with reddish touches.

The sides are of the same tubercled type, but the plant is less fleshy; they appear more slender with some sharper furrows. They are more numerous averaging from 14 to 18, and even 20 to 30, not over  $\frac{1}{2}$  inch in height.

There are two types: those with rows of tubercles and those with sides broken up into separate tubercles, but not spirally as in *Mammillaria*. The areoles vary from  $\frac{1}{4}$  to  $\frac{3}{4}$  inches apart.

The spines vary from 4 to 14, are shorter and thinner than the genus *Gymnocalycium* and usually very dark, even pure black. They are likewise curved and most frequently towards the top. The centrals are very rarely absent but remain few in number and slightly longer. *Neoporteria senilis* is exceptional with its 30 white spines 2 inches in length.

One can classify the *Neoporteria*s by Schumann's key but it is no longer necessary to carry as many species.

All are originally from the Andes of Chile and are under the influence of the climate of the Pacific. This is, however, deeply altered by the current, as already pointed out by von Humboldt, which extends along almost the entire coast, with areas which are extremely arid. The chill from the water of this current condenses the moisture from the sea and the coast is but slightly affected by fog and infrequent rains. This often exaggerated dryness, together with the great altitude, renders the climate very harsh for the plants. One should therefore be very sparing with the



watering and discontinue this during the winter.

These conditions of the climate, long unrecognized, have given to the Neoporterias a sad reputation of plants difficult to grow. Now, with proper treatment, we grow them on their own roots and it is not necessary to graft them. Grafting is done chiefly among the amateurs and growers whose impatience with the slowness of the growth demands quicker maturity and flowers.

The culture in winter requires a cool temperature with absolute dryness; in summer full sun, warm temperature, and little watering. They should be sprinkled rather than soaked.

#### LATH HOUSES

By MR. CHARLES LEWIS

From Heart of America Cactus Club Bulletin

Some gardens are so fortunately located that they do not have any need for a lath house, having in its place a large tree that does not have too dense a foliage, any shade loving plants may be grown under its branches, and Epiphytes or other climbing cacti present a beautiful sight with their large night-blooming flowers.

The size or shape of a lath house is governed by the amount of money or the ingenuity of the builder, it may be a very simple lean-to covering to break the direct rays of the sun from your plants.

An ideal lath house is seven by eight feet in size and seven and one-half feet high. The frame is made of two by three inch strips, the corner posts are five feet high. The sides, ends and roof are made in sections and bolted together so that it is very easy to assemble or take down in a hurry.

The sides and roof sections are the same size: four by eight feet with braces across the corners.

The end sections are seven feet wide and five and one-half feet high.

The door is five and one-half feet high and two feet wide placed in the end most convenient to the individual.

The bottom of the house should be boarded up solid for about two feet around the bottom to keep out drafts from the roots of the plants.

This house requires about three hundred laths to build. Two weeks spent in a house of this kind will condition your plants so that they may be set out without damage to the tender growth of the plants.

Orchid Cacti (Epiphyllums), Rhipsalis, and other cacti respond to this care. Fuchsias, begonias, primulas and ferns respond to this environment and grow well if potted in leaf mold. The night blooming cacti may be left in the lath house all summer and will bloom freely if undisturbed. Hanging plants may be suspended from the cross beams.

The lath house is a very good place to have your propagating bench as it is a nice place to work. Cuttings root very easily there while grafts require the same protection and even the Echinopsis will grow faster with this partial protection from the summer heat.

There is no structure of such simple construction with so many advantages for the cactus grower. Move your plants into the lath house in the fall as a protection from the frost and in the spring it is a handy place for repotting your plants. Last but not least the lath house controls the worst garden pest—the neighbor's dog.

## NOTES ON CACTI OUT OF DOORS

North Latitude 38°—23°—20°

West Longitude 122°

By F. B. NOYES

EDITOR'S NOTE: The plants mentioned in this article should be among the first with which one should be familiar. You will find them pictured in: *Cacti for the Amateur*, Cactaceae, Britton and Rose, the *Journal* and the *Bulletin*.

In this particular spot of our U. S. A., which lies on a shelf sloping south toward the Vaca Valley in Solano County, California, cacti have been grown out of doors for six years with considerable success.

Several drought resistant trees and shrubs were also doing well until the wet winter of 1939-40. Then two of the best, *Atriplex hymenelytra* and *Fremontia mexicana*, succumbed to the excess moisture.

Climatic extremes here are 18° to 118° F. Fortunately these temperatures do not occur very often, only when we Californians have unusual weather. The annual rainfall varies from ten to fifty inches with an average of twenty-four. For this reason most desert cacti do well but tropical kinds can only be grown in a greenhouse, and others which require much moisture, both in soil and air, do better nearer the sea coast.

All cacti are grown out of doors in raised beds of light sandy soil which was placed on top of a heavy sub-soil. The surface is scattered with gravel and occasional rocks to lessen the spring weeding and for landscaping. These rocks form excellent ant traps and whole nests are eliminated with a little gasoline. No fertilizer is used except to spread wood ashes from the fireplace when it accumulates during the winter.

The plants to be discussed are growing well and with few exceptions are in good shape.

*Acanthocalycium violaceum* comes from Argentina and is easily mistaken for an Echinopsis. As it is not a desert type it needs shade and ample water during the summer.

*Ariocarpus fissuratus* and *A. furfuraceus* are both spineless and need good drainage with plenty of lime. The flowers are of various shades of pink. It is commonly called Star Cactus.

*Ancistrocactus scheeri* is easy to grow. Its greenish yellow flowers are on display several times during the summer and are more unique than handsome. The root is carrot shaped. Give this full sun the same as *Ariocarpus*.

*Astrophytum asterias* or the Sea Urchin is either an all green or all brown plant with the white dots and yellow flowers. It is spineless and can stand more moisture than the others. *A. capricorne* var. *luteum* is rather difficult and grows slowly. Its spines are quite curly and weak. Not as good looking as others. *A. myriostigma* has several varieties, all without spines. The five-sided one or Bishop's Cap is most common. The one with four sides is somewhat more rare and the three sided one is very rare. *A. ornatum* also has several varieties, all with spines which are curled or straight. Var. *mirbellii* is the handsomest. Its spines are on widely separated ridges and the green plant body shows between covered with white tufts of felt about an eighth of an inch apart. The flowers are yellow with a red center. This plant needs plenty of lime.

*Bergerocactus emoryi* is a small *Cereus* native of Lower California extending a short way into this state. It never gets far from the sea coast and needs plenty of water in summer differing from many cacti in that way. Covered with golden spines this is a very



good looking plant although old stems finally turn a dirty brown.

*Binghamia chosicensis* and *B. pseudomelanostele* were obtained under the name of *Haageocereus*. They look like a short, stout *Bergerocactus emoryi* even though they are from Peru. The spines do not change color and remain a bright yellow. They are slow and shy bloomers.

*Brittonia davisii* is now classed as a variety of *Hamatacactus hamatacanthus* and will be spoken of under that heading. To further bother the amateur catalogue reader it was also formerly classed as a more hardy and northern variety of *Ferocactus bama-tacanthus*.

*Carnegie gigantea* grows so slowly that ten years or more will be needed to report on its behavior. The wet winters have caused it to burst the skin but since no rot started it healed and filled in the following summer. All friends of the cactus tribe certainly hope that the contagious rot now affecting mature plants in Arizona can be controlled.

The genus *Cephalocereus* contains many large size individuals. It formerly was rather large in numbers but according to the latest classification many members have been placed back in *Pilocereus* where they formerly were. *C. hoppenstedtii* does not have the long hair of *C. senilis* but does have an abundance of long gray spines. It rarely branches and grows faster than *C. senilis*. The flowers are red.

The Mexican Old Man, *Cephalocereus senilis*, reaches a large size but very slowly. It is one of the most desired cacti and more are imported from Mexico than probably any other kind. Never becoming woody cuttings of any size can be rooted. The red flowers do not appear until the plant reaches a respectable age. It should have lime and protection from the birds during the spring as the hair from the new growth makes fine nest lining material. A bald cactus looks no better than a bald man and both suffer easily from frost or sunburn.

*Cereus jamacaru*, *C. peruvianus* and *C. validus* are all large and differ outwardly when not in bloom by their skin color and number and length of spines at the areoles. All bloom at night. They are of average culture but if overwatered in summer-time will give warning by bursting their skin. This does no harm and will fill in if the water is withheld.

It is interesting to watch the flowers of *Cereus peruvianus* unfold about nine o'clock on a warm June evening. The flowers must exhale an attractive scent an hour or so before they open, for the bees collect in numbers and make a frantic effort to enter the closed buds. As the dusk deepens the bees finally leave for their hives in disgust. Those who finally feast must arrive early in the morning before the sun gets hot and destroys forever the fragile flowers.

*Cleistocactus baumanni* and *C. smaragdiflorus* look nearly alike but their flowers differ. Those of the former resemble a Chinese firecracker, red all over; while the flowers of *C. smaragdiflorus* are the same shape but with the outer end dipped in emerald paint. They never open wide. *C. strausii* is the best looking species of this genus at all times of the year. The spines are almost white on new growth and when mature are slender needles, tougher than appearances warrant. Never transplant this cactus except in summer as they will invariably rot the rest of the year.

Collected Coryphanthas are as a rule hard to establish. Those most difficult are *C. desertii*, *C. echinus*, *C. recurvata* and *C. sulcata*. I have not been able to get *C. radiosa* through our hot summers. It probably needs the cold winters and cool summers of its native home in Colorado.

Those congenial and easy to establish are *Coryphantha aggregata*, *C. cornifera*, *C. elephantidens*, *C.*

*erecta*, *C. macromeris*, and *C. robustispina*. *C. aggregata* is my favorite for general appearance while *C. desertii* and *C. macromeris* have the best flowers.

*Dolichothele sphaerica* is not a desert type and should have the treatment of a geranium. It has an abundance of clear yellow flowers. More correctly this cactus has been reclassified as a *Mammillaria*.

*Echinocactus platyacanthus* and *E. grusonii* from Mexico needs more moisture than *Echinocactus horizontalis* and our *E. polycephalus*. *E. horizontalis*, which never gets large, absolutely will not stand wet feet and should have rocks or gravel against its under side while the roots reach farther down into soil. It has a beautiful pink flower somewhat like *Homalocephala texensis* but without the petals being frilled. *E. polycephalus* is a forbidding specimen of the cactus world with pink flowers. Most other *Echinocacti* are yellow flowered. Collected plants are slow to establish themselves and should have good drainage. Plant in the warmest and most rocky location. Not in active growth until temperature reaches 90 degrees in the shade.

The genus *Echinocereus* is numerically the third largest in the cactus family. Several species are called Strawberry Cactus and bear excellent fruit, delicious alone or with sugar and cream. Their satin flowers are excelled in beauty only by *Epiphyllums* mainly because of the latter's very large size.

The three best fruiting types are *E. enneacanthus* from west central Texas, *E. stramineus* from extreme west Texas and *E. cinerascens* from Mexico. With age they form large mounds, especially *E. stramineus*. These plants are a wonderful sight to see, a spiny hemisphere four or five feet across, covered with large silk-like purple flowers gleaming in the sun.

The Arizona Rainbow, *E. rigidissimus*, intergrades with *E. dasyacanthus*. It has pink flowers and is one of several species which possess bright colored spines. In our wet climate most specimens wash out or fade in a year or two. A Mexican Rainbow, *E. pectinatus* var. *rufispinus* (so called by the exporter in Mexico) does not fade and in this climate is a more desirable cactus. The flowers are a pale pink with contrasts well with the intense coloring of the many surrounding spines. It is also not quite so choosy of soil or location. The Colorado Rainbow, *E. viridiflorus*, is very hardy and holds its spine colors well. The rather small flowers are more strange than good looking. *E. chloranthus* is similar but not as hardy and has the same greenish yellow colored flowers.

Yellow flowers are not common among *Echinocerei*. *E. dasyacanthus* and *E. subinermis* are the two main representatives. The first has very large flowers, often larger than the plant itself. It is a desert type and sensitive to excess moisture.

*Echinocactus salm-dyckianus*, which has a tubular orange-red flower rather unusual in shape and color comes to us from Mexico. It is not common at present but is easily grown.

Four scarlet-flowered species native to the United States are *E. coccineus*, *E. mojavensis*, *E. polyacanthus* and *E. triglochidatus*. An added attraction is that the flowers of these species remain open day and night and in the case of the last mentioned, they stay open for a week or even longer. All are comparatively hardy. Like many another good cacti, the native supply is being badly depleted by the over-zealous amateur and professional collectors.

*E. delaetii* resembles a young *Cephalocereus senilis* but in a year or two its caespitose habit shows how obviously different they are. This cactus needs lime as seems to be the case with most white spined types. It is a shy bloomer in captivity.

To be continued

## IF TWO DO THE SAME

By DR. THEODOR PHILIPP HAAS

Everybody knows a cactus, this prickly, fleshy plant, native in North-, Central- and South-America. The cacti are living in deserts, or in areas with arid conditions.\* They are indigenous only in the New World, though they are segregated by man to other parts of the world.

The cacti are very interesting plants. The dryness of the habitat in which they live, makes it necessary that they save water. The transpiration has to be limited, and the way this is accomplished is by limitation of the transpiring surface. Except a few species (Pereskia species and some Opuntia species), the cacti have no leaves. These are reduced to thorns—leaf-thorns.\*\* The stem, or body, has taken over the task of the assimilation of the carbonic acid of the air; therefore, the cactus is green. Besides this fact, water is stored in the thickened stem or body; therefore the latter is fleshy, or succulent. It was found that the fresh cactus contained 90% water by weight! If we make a cross section through a cactus, e.g. a Cereus, we see outside a tissue of leaf-green chlorophyll containing cells, then comes a colorless layer of water storing cells. Afterwards follows the wood corpus. Old cacti really contain wood!

The cactus family is divided in different sub-families and genera, like Opuntia, Mammillaria, Cereus, etc., which make up some 13000 species. This means that we have about 13,000 different cacti! For comparison I will mention that we have about 20,000 different orchids.

The cacti belong to the "stem-, or shoot-succulents," as we botanists say. We know also plants with fleshy leaves. The species of African Aloe, or the most interesting species of Mesembryanthemum which also are native in Africa, belong to this group. Here the water is stored in the leaves and therefore we call them "leaf-succulents!"

If we compare the stem of a column-shaped cactus like Cereus, with an ordinary tree, then we see the difference between both. Hence we speak of a "shoot metamorphosis" among cacti

as a result of other functions which has here the shoot to fulfill.

But at this comparison we may observe another fact. The stem of a tree is mostly round; therefore a cross section would correspond with a cylinder. The stem of a cactus, if it is not flat as in Opuntia or Epiphyllum, has outgrowths in the shape of warts or ledges (tubercles and ribs) alongside the shoot. The first case occurs e.g. in Mammillaria, the latter in Cereus. These outgrowths have to increase the assimilating surface. A cactus is a compromise between the transpiration which demands a reduction of the surface with its stomata, and the assimilation which desires an increased surface. Beside this, these outgrowths increase also the possibility of storing more water by containing a water storing tissue.

The same problems that the cacti in America must face, are also faced by plants living under similar conditions in Africa. They do this in the same manner and so we may understand that the "cactus shape," or "cactus form" is not limited to the cacti. The following five illustrations show American cacti and African stem succulents.

Fig. 1 shows a group of cacti. Fig. 2 shows succulent Euphorbias from East-Africa, especially *Euphorbia grandicornis*. (The difference in the thorns has its cause in the fact that we have here "stipule thorns" in contrast to the "leaf thorns" in cacti.) Fig. 3 shows *Stapelia hirsuta*, a member of the Milkweed Family, native to South-Africa. The big flower is a red-brown color and smells like decayed meat.

The best solution of the problem—in cacti and in Euphorbiaceae—occurs in spherical forms. In a sphere the largest volume is united with the smallest surface and thus they display also the largest volume with the smallest surface. In a spherical cactus it was found that the transpiration was 6000 times less than in an *Aristolochia durior* (Dutchman's Pipe) of the same weight, which is a winding shrub with normal leaves!

Fig. 4 shows *Euphorbia obesa* and *Euphorbia meloformis*, all spherical members of the spurge family and native of South-Africa. There are also hybrids between both. These are not cacti at all! Fig. 5 shows *Euphorbia obesa* (right) with a cactus (left) of the same size: *Astrophytum asterias*, native of Mexico. This illustration, especially, shows the similarity very well. The photograph was taken during flowering time. We see the flowerbud of the cactus and the small inflorescences of the Euphorbia. Natu-

\*Among the cacti are also epiphytes; to them belong Epiphyllum species with their extreme flat branches, and Rhipsalis. They live in a more or less humid climate, but, like other epiphytes, they have to hold fast, or to store the water. (Compare with the epiphytic tropical orchids with their "pseudobulbs!")

\*\*A "thorn" is always a transformed organ. We know leaf-thorns; also the stipules may be transformed into thorns (e.g. in some Acacia species, sometimes, because they are hollow, inhabited by ants), stipule-thorns. We know shoot-thorns (Crataegus) and root-thorns (Palm tree Acanthoriza). But the rose has prickles, out-growths of the epidermis; these are not thorns!

rally these plants differ by their flowers and hence they belong to different families in the plant system.

We call this phenomenon "convergence." It happens also in other cases, for instance in the great similarity between the American *Agave* and the African *Aloe*, both living in a similar habitat.

We conclude our article with an interesting story. In Chile there is a parasite, belonging to

the mistletoe family, to the LORANTHACEAE. This parasite is living on *Cereus* and, as the host plant, it has no leaves. The name is *Loranthus apbyllus*. Also in the Namib desert of South Africa a leafless parasite, *Loranthaceae* of a similar shape, lives on a *Cereus*-like *Euphorbia*. Fig. 6 shows in a botanical preparation the cactus on the left side and on the right side the *Euphorbia* with their parasites.

We see how far may go the convergence!



FIG. 93. For captions see page 189

## TWO NEW OPUNTIAS FROM THE GRAND CANYON REGION IN ARIZONA

By J. PINCKNEY HESTER

The two *Opuntias* here proposed as new have been studied carefully in the field and both herbarium specimens and photographs prepared for distribution to several institutions. Areas of considerable extent have been explored in order that their range and the degree of variation within the species might be thoroughly worked out.

### *Opuntia hualpaensis* sp. nov.

Plants 1.5 m. high or less, sometimes short-caulescent, usually openly branched from the ground, spreading; roots fibrous; leaves green, terete, caducous, 2-4 mm. long, with acute, pinkish tips; old stems woody; ultimate joints clavate, terete, strongly tuberculate, 5-10 cm. long, 1.5-2 cm. in diameter; tubercles overlapping, arranged in spiralled rows, yellowish green, 1-1.5 cm. long, 4-6 mm. broad and deep; areoles oblong, with short, yellowish felt, glandular on new growth; glochids on terminal joints few, on fruit many, yellowish, in short, compact clusters; spines unequal, 2-4 of them sheathed, gray or brownish, 1-3 cm. long, 3-6 spines acicular, gray, 5-8 mm. long; flowers open one day only from 10 a. m. to sundown in July and August, greenish yellow, irregularly funnelliform, 4 cm. wide, about 2 cm. long, terminal; sepals 8-10, obovate, some minutely apiculate, greenish below, Heather (45K1)\* around the tip; petals 1.5 cm. wide, and 2 cm. long, obovate to obovate-obcordate, sometimes apiculate, entire below but usually minutely erosulate distally, greenish yellow (17H1), the tip sometimes tinged with Heather; style stout, 1.7 cm. long, yellowish (17H1); stigma-lobes 6, usually in 2 erect, slightly divergent rows, attenuate, obtuse, 3 mm. long, 17H1; filaments 10-12 mm. long, spreading, somewhat attenuate, attached to wall of conical cup near base of style, 17H1; anthers hastate, minute, 0.5-1 mm. long, 17H1; ovary clavate to fusiform, 2.5-3 cm. long and 1.5 cm. in diameter, Danube Green (31A10), tuberculate, the short-felted areoles bearing many short, yellowish glochids and sometimes 2-4 short, gray, acicular, deciduous spines; fruit large, fleshy, clavate to fusiform, persistent for 1 year or more, 3.5 cm. in diameter, 4 cm. long, sometimes proliferous but not more than 2 fruits seen in one chain, remarkably variable in color, the sunny side varying from Peruvian Brown (13L11) to Heather, the shaded side about Bistre Green (13L5), the conical umbilical scar, left by the caducous perianth, 7-9 mm. deep and 9-12 mm. in diameter; seeds about 30, smooth, compressed, 2-3 mm. broad and 1.5 mm. thick; about India Buff (12E5) with a narrow band around the perimeter; hilum an indistinct line across perimeter with a basal dimple on either side; the seeds of mature fruit are on the walls of a cavernous area 1.5 cm. in diameter.

Planta perennis ad 1.5 m. alta laxae patentisque ramulosa; radices fibrosae; folia teretia caduca 2-4 mm. longa apice acuta rosea; caudex maturus lignosus; articuli clavati teretes 1.5-2 cm. lati 5-10 cm. longi tuberculati; tuberculi 4-6 mm. latis altisque 1-1.5 cm. longis spiralis; areolae oblongae tomentum flavidum et glochidia flava ferunt; spinae inequales, 2-4 spinarum 1-3 cm. longae cinereae vel brunneae vaginas chartaceas ferunt, 3-6 spinarum aciculares cinereae 5-8 mm. longae; flores infundibuliformes virido-flavi diurnales circa 2 cm. longi 4 cm. lati; sepalis 8-10 obovatis minute apiculatis base viridibus apice roseo-purpureis; petalis circa 1.5 cm. longis apice erosulatis virido-flavidis vel apice roseo-purpureis; stylus robustus 1.6 cm. longus flavidus; lobis stigmatibus 6, obtusis circa 3 mm. longis; stamina numerosa 10-12 mm. longa; antheris hastatis circa 1 mm. longis; ovarium clavatum vel fusiforme 1.5 cm. diametro 2.5-3 cm. longum viride tuberculatum; areolae ovariorum glochidia numerosa breviter flava et 2-4 spinas cinereas aciculares diciduosas ferunt; fructus carnosus clavatus vel fusiformis persistens 3.5 cm. diametro 4 cm. longus; semina circa 30, glabra compressa 2-3 mm. lata lutea-brunnea.

*Type:* Deposited in the Dudley Herbarium, Stanford University, No. 285575, collected along U. S.-Arizona Highway No. 66, 11 or 12 miles east of Peach Springs and 2 or 3 miles west of Hyde Park, Arizona, by J. Pinckney Hester, July, 1942.

*Distribution:* In widely separated colonies in northwestern Arizona.

The small glands in the areoles that excrete a clear nectar, only during flowering, probably promote pollination, for many small ants dash madly from areole to areole, pausing at each for the nectar, if any.

As *O. hualpaensis* is a member of the Series 3. THURBERIANAE the key is modified to show its relationship to other species in that series, as follows:

\*The color names and keys are from McGraw-Hill Book Company's "Dictionary of Color" by Maerz and Paul.

Bushy or arborescent species, 6 dm. high or higher.

Tubercles narrowly oblong, 1 cm. long or more.

Joints readily detached. - - - - - *O. vivipara.*

Joints not readily detached.

Longer spines 2.5 cm. long or longer.

Flowers orange to scarlet. - - - - - *O. tetracantha.*

Flowers not orange or scarlet.

Flowers purple. - - - - - *O. recondita.*

Flowers yellow with reddish tips. - - - - - *O. hualpaensis* sp. nov.



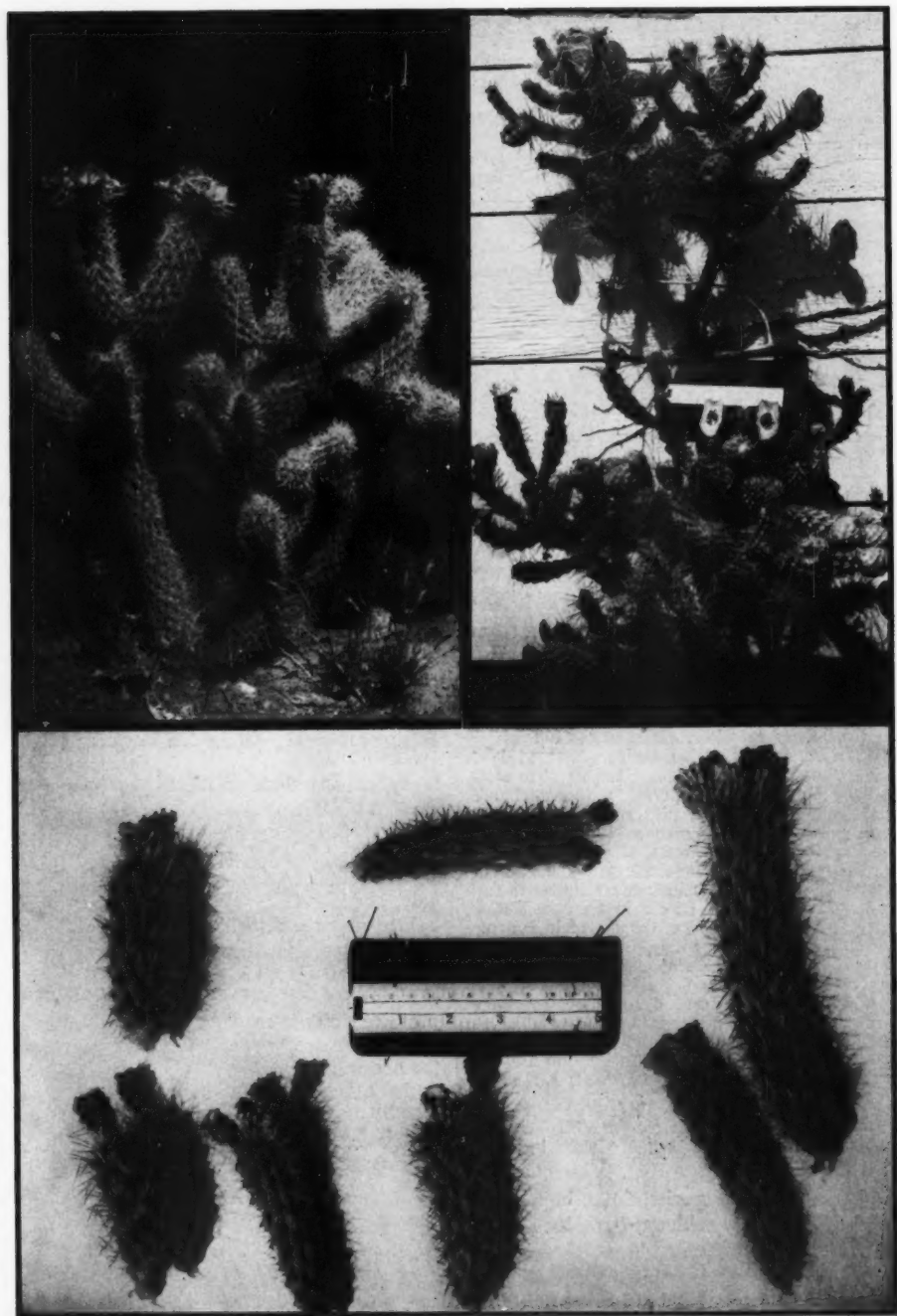


FIG. 94

UPPER LEFT: Flowering plant of *Opuntia abyssii*. UPPER RIGHT: Two plants of *Opuntia hualpaensis* showing fruit and one flower. Note the 5-inch rule between the 2 plants behind a divided fruit. BELOW: Fruit and joints of *Opuntia abyssii*. Photos by author.



The author first saw and collected these plants in 1934 in Peach Springs Canyon, some of which are growing under accession No. p 33 at the Boyce Thompson Southwestern Arboretum, at Superior, Arizona, where cuttings from the type locality are growing under No. Q42. These plants, so far as known, grow only in sandy soil, from the Juniper belt at about 5000 feet elevation down to 3000 feet or even lower, for a large colony of similar plants with seemingly identical fruit and seeds, was found in Boulder Dam Recreation Area at about 2000 feet elevation.

This species is found on and near the Hualpai Indian Reservation, hence the specific name, *bualpaensis*, the availability of which was passed upon by Dr. Ira L. Wiggins, Director of the Dudley Herbarium, Stanford University, to whom the author is indebted for the Latin diagnosis.

Herbarium material, including cuttings, fruit and photographs, was sent to the Arnold Arboretum, Mr. Ira W. Clokey, the Huntington Botanical Gardens, the Missouri Botanical Garden, and the type to the Dudley Herbarium, Stanford University, California.

The reason for writing such a detailed description is the well known and notorious fact that most of the confusion in the Cactus World has its origin in the abbreviated, incomplete, or erroneous original descriptions, too often based on insufficient, fragmentary, or inadequate material.

#### *Opuntia abyssii* sp. nov.

A low, spreading, caulescent, openly branched bush 9 dm. high or less; trunk short, cylindric, woody, 7 cm. in diameter or less; branches terete, jointed, tuberculate, not readily detached, usually set at an acute angle to the trunk; ultimate joints cylindric, 11-15 cm. long and 2.5-3 cm. in diameter; tubercles firm, gray-green, overlapping, usually in 7 spirally arranged rows, about 1.8 cm. long, 6-8 mm. thick, and 4-5 mm. tall; areoles oblong, bearing short gray wool in youth only, spinescent below, glandular on the ovaries, about 2 mm. wide, 4 mm. long, glochids absent on new growth; spines 10-14 in each areole, white or gray, acicular, radiating, unequal, the larger ones in the center sheathed, 5-20 mm. long; leaves terete, 4-5 mm. long, green, with acute, pinkish tips; flowers opening in April and May, rotate, terminal, yellow-green, 3.5-5 cm. in diameter, 3 cm. long or less, each remaining open continuously for several days, finally wilting and closing around the style; sepals 8-12, apiculate, obovate to obovate-obcordate, entire, 1 cm. wide or less, midsection greenish, base rather fleshy; petals 5-12, not fleshy, about Javel Green (19L2), obovate or obovate-obcordate, sometimes minutely apiculate, entire below, erose or finely fringed around the outer end, about 2 cm. long and 8-13 mm. wide, the dried perianth caducous; filaments spreading, attached to walls of conical cup, 5 mm. long, Aureolin (10L2); anthers 2 mm. long, Light Chrome (10L4); style robust, attenuate, Endive (17L3), 2 mm. in diameter, about 1.6 cm. long;

stigma-lobes 4, about 3 mm. long, attenuate, slightly spreading, usually obtuse, sometimes abruptly apiculate, Aureolin; ovary Forest Green (12L6), somewhat clavate, about 2 cm. long, 1.5 cm. in diameter, tuberculate, the tubercles usually in 7 spirally arranged rows, 2 cm. long or less, 2.5 mm. wide and high; areoles circular or short-oblong, bearing a few short, white glochids above, many weak, caducous spines to 1.5 cm. long below, and minute glands in center that exude a clear nectar; fruit persistent, yellow-green, somewhat clavate, tuberculate, glabrate, 2.5 cm. long, 1.5 cm. in diameter; umbilical pit conic, 1 cm. deep; seeds numerous, sometimes 100 per fruit, flattened, gray, smooth, 3-4 mm. broad, 1.5 mm. thick; circular in outline around the perimeter which bears a narrow band, hilum sometimes minutely beaked, usually a mere line 1 mm. deep across the basal perimeter.

*Planta perennis humilis patente ramosa 9 dm. alta, ramulis teretibus articulatis tuberculatis, articulis cylindricis 2.5-3 cm. diametro 11-15 cm. longis; tuberculi cinereo-virides circa 18 mm. longi 6-8 mm. lati 4-5 mm. alti; areolae oblongae 2 mm. latae 4 mm. longae spinas inferiore et areolae juveniles tomentum brevum cinereumque ferunt; spinae 10-14 albescentes vel cinerae aciculares inaequales 5-20 mm. longae, spinae longiores centralesque vaginas chartaceas ferunt; folia teretia 4-5 mm. longa viridia acuta apice rosea; flores rotati 3.5-5 cm. lati circa 3 cm. longi flavidovirides, sepalis 8-12 apiculatis obovatis vel obovato-obcordatis integris circa 1 cm. latis base carnosius; petalis 5-12, flavido-viridis 8-13 mm. latis circa 2 cm. longis obovatis vel obovato-obcordatis per occasionem minute apiculatis base integris apice erosulatis; stamina numerosi, antheris 2 mm. longis; stylus robustus circa 1.6 cm. longus, lobis stigmatibus 4 circa 3 mm. longis; ovarium clavatum 1.5 cm. latum 2 cm. longum, circa septem series tubercularum fert; fructus clavatus flavido-viridis tuberculatus glabratus 1.5 cm. latus 2.5 cm. longus; semina 3-4 mm. lata compresso-orbicularia cinerea.*

*Type:* Deposited in the Dudley Herbarium Stanford University, No. 285624, collected in Peach Springs Canyon, which empties into Diamond Creek about 3 miles from the Colorado River in Grand Canyon, Hualpai Indian Reservation, northwestern Arizona, by J. Pinckney Hester, in 1939.

*Distribution:* Known only from the type locality where it first appears about 7 miles north of Peach Springs Post Office; thence northward, being most numerous about 13 miles down the canyon, whence it extends to Diamond Creek in ever diminishing numbers. The rocky hill-sides and boulder-strewn floor of the canyon are the favored haunts of this distinctive species which flourishes with what appears to be *O. acanthocarpa*, from which it is a probable mutant. *Opuntia basilaris* and *Phelosperma tetrancistra* also grow here, with *Ferocactus Lecontei* (?), *F. xeranthemoides*, *Pentstemon Palmeri*, and *O. bualpaensis* flourishing much higher in the upper end of the canyon.

Britton and Rose's key to the Series 4. ECHINOCARPAE modified to include the new species follows:

Tubercles short, less than twice as long as wide.	Fruit short-spiny, little tuberculate.
Spines with yellow-brown sheaths . . . . .	<i>O. serpentina</i> .
Spines with white or straw-colored sheaths. . . . .	<i>O. echinocarpa</i> .
Tubercles elongated, 2 to 3 times as long as wide.	
Fruit long-spiny. . . . .	<i>O. acanthocarpa</i> .
Fruit short-spiny.	
Fruit strongly tuberculate, caducous-spiny or glabrate. . . . .	<i>O. abyssii</i> .
Fruit little tuberculate, short-spiny. . . . .	<i>O. Parryi</i> .

Herbarium material, including cuttings and photographs, was sent to the Huntington Botanical Gardens, the Missouri Botanical Garden, Mr. Ira W. Clokey, and the type, including pressed flowers, to the Dudley Herbarium, Stanford University. Several of the plants collected in 1939 are now growing at the Boyce Thompson Southwestern Arboretum, Superior, Arizona,

under accession No. P32.

The specific name *abyssi* was selected as the proper form of the name suggested by the author upon the advice of Dr. Ira L. Wiggins, who also wrote the Latin diagnosis.

Ranchito Bella Vista,  
Saint George, Utah.

#### MEETING EASTERN CACTOPHILES IN 1943

I had some important reasons to take a trip back east last spring. I was there only three weeks but between the other matters I managed to have a good time with a few cactophiles. I like cactus people and feel at home with them. Most of us do. Most of my past contacts with them have been by letter, now I saw some of them in person.

I spent a week close to Philadelphia. During that time I visited four collectors and their plant pets. Mrs. Fenton of Upper Darby is an old friend by correspondence. She lives in a row of small, comfortable houses with a tiny square of front yard. It was late in May. Her plants were all in the front yard. Some were on a stand, others setting about in strategic spots in the yard. They were all still potted. Mrs. Fenton likes variety, prefers cacti to succulents. So does her friend, Mrs. Barnes of East Lansdowne, another Philadelphia suburb. Mrs. Barnes had her plants sitting on a bench in the back yard. Visiting Mrs. Barnes that day was Mrs. Carlitz, so I must visit her collection, also. She lives in an apartment with good south windows. Her plants are in beautiful containers and she has a flair for arrangement. She prefers all very small types of plants. Mr. Boone, another correspondent, prefers *Haworthias* and is gradually accumulating a nice collection. He lives in a small house in a city block. There is only a tiny back yard. His *Haworthias* were in a living room window and showed his great care for them. Later he sets them out in the yard he told me.

I had six days in New York. I met two good collectors there, one a former correspondent, the other a new friend by way of the JOURNAL. The former is Dr. H. E. Anthony, whose home is in Englewood, N. J. Dr. Anthony and his daughter took me to see the famous New York Botanical Gardens. I was much impressed by the fine collection of succulents there. The Mesembrys, stemless types, were a sight to see. So were the *Haworthias*, and kindred plants. The latter are my favorites of the succulents. On another day I visited the Anthony's in their home and saw the Doctor's nice little greenhouse built with its back to the garage. He is collecting *Epiphyllums*, *Echeverias*, and *Stapelias*. The greenhouse is heated by a small stove in the garage with heat piped to it. Dr. Anthony says that there is no cactus club in New York. I wonder if this is really true. I never heard of one, but it could easily hide in that huge city. The other collector I visited was sixteen-year-old Eileen Curran

of Staten Island. She has about two hundred plants of the small types. She is very fond of *Haworthias*, also. She knows her plants by name, and many things about them. She has the best collection of books I have ever seen in the hands of a private collector and she studies them. She has quite a problem, that most of us do not have: living so close to the sea, the air is extremely humid and watering is a real problem.

I also visited the Botanical Gardens in Washington, D.C. Not knowing any cactophiles in Washington, I went alone. The collection is small and I would guess rather new. I'd like to know more about it.

And last but not least I spent three days in Chicago. This was a real treat, also. It just happened that I had a chance to visit both the Cactus Society, and the Cactus Club. There are a few members that belong to both organizations. I made my headquarters with Mrs. Radden, a good correspondence friend. Mrs. Radden has a lean-to greenhouse on the south side of her home with some five hundred species. She prefers small cacti such as *Lobivias*, *Stenocacti*, and *Gymnocalyciums*. She also likes *Euphorbits*. Her collection is outstanding in this part of the country. I also saw two other collections; those of Mrs. Berry and Mrs. Glawe. These folks both have small glasshouses. The Cactus Society met at Garfield Park, so I got to meet a number of them. I was roped into making a few remarks at both organizations. Mr. Balthis showed some of us through the Garfield Park conservatory—a most fascinating place. The Club met at the home of Mrs. Hunter. It was evening, and I didn't get there in time to see very many of her plants.

Some day I'm going back over this ground. It was just a taste. And when I go again I want lots of time to see more people and cacti. I was deeply impressed by the devotion of cactophiles to their living collections. This is more than a hobby. As Mr. Cutak has said recently, "It is a cult, in the sense of its being a devotion to a fine idea." ELINOR T. SUTTON.

#### FROM AMBOY, ILLINOIS

My cactus garden was a riot of color this year, 206 different kinds bloomed for me. We have enjoyed one of those typical, beautiful, warm falls with plenty of sun. Our first killing frost was Oct. 16th, and have only had 2 more since then. Have all my plants, about 1500, put away for the winter. Some of my pots (14-inch) weighed 150 lbs. What we Cactophiles won't do for our hobby?

PROF. ARTHUR BLOCHER.



Looks like I've started something. I had expected repercussions to my recent story on the barrel cactus and took cognizance of presenting the facts as clearly as I could. After all, we argue a moot question, a question which every one has heard something about, but no one could say whether it was true or not. The whole argument on the barrel cactus shows that there are men, and always will be men, on both sides whose words cannot be questioned. In other words, the whole thing boils down to a difference of opinion. Perhaps the difference springs from a different sense of taste, as I have already pointed out in last month's *Spine Chats*, or from the people having tried different species of cactus, or having tried the barrel at different seasons.

Often we are ignorant of sources of supply of edibles and drinkables which we have at hand, and the fact that we have never heard of them, nor investigated in detail, can not be construed to mean that such sources are not available. Quite recently, there has been a story run in the newspapers telling how men marooned on a raft could drink water squeezed out of fishes. So whether the bisnaga juice has to be gotten by squeezing the mucilaginous contents or chewing the pulp does not matter as long as it will soothe a parched throat, even though it might prove repulsive to some individuals. A Frenchman will eat snails, a Mexican will eat worms (gusanos de maguey), and some Africans will feast upon roasted grasshoppers which an American would not think of sampling. Such is the case of the barrel cactus. Those who know of it, go to it; those who do not, do not think of going to it; and those who have heard of it, may not like to try or if they tried, didn't care for the taste either. But the facts, after all, are and to bring them out is a duty. By the use of generalities, I have tried to reinforce in my readers' minds the fact that this discussion is neither useless, nor necessarily untrue at both ends.

During Thanksgiving week a most pleasant surprise awaited me. Dr. and Mrs. H. A. Geitz, the cactus-minded couple of Monterrey, Mexico, paid us a visit. You've heard me speak of the Geitzes before. They live in a penthouse, atop Hotel Colonial, from where magnificent views of the Cathedral and the famous Saddle Mountain can be had. In their rooftop home, there is housed an excellent collection of cacti and succulents, most of which were collected by them on trips throughout Mexico. Dr. Geitz, a native St. Louisan, has established an enviable reputation in Mexico, where he has been a practicing physician for 33 years. Mrs. Geitz hails from the East and her love for cacti was probably aroused by a famous brother-in-law, Dr. Gerrit S. Miller, Jr., who did some collecting for Drs. Britton and Rose, when these cactologists were conducting their great research on this great American family. Dr. Miller was the Curator of Mammals in the Smithsonian Institution and today serves as Associate in the same department. There is a rather poorly reproduced picture of the eminent mammalogist in Volume One of "The Cactaceae" (p. 39). Mrs. Geitz has the far better opportunity to look after the plant collection than her husband and she often

drives out to Rinconada when her soil supply runs low. Rinconada is a famous pass west of Monterrey, where cacti grow in profusion.

Most of us are acquainted with the fine work performed by William Taylor Marshall during his incumbency as President of our national organization. You'll be surprised to hear that for sixteen years he sold groceries wholesale to stores, mines and camps on the deserts of California, in western Arizona and in Nevada. During that time, Bill Marshall had not the slightest idea that the plants he encountered on his desert journeys would someday become his life study. One Easter day, Bill's daughter presented her father with a cactus purchased from the dime store. Naturally he treasured the gift and shortly after began bringing other plants from his trips to make a desert garden. When friends asked the name of his plants he could not give it to them. It was discouraging from the start, but his efforts to identify the cacti led to the research which still continues. To increase his collection, Marshall made trips to Utah, New Mexico and western Texas and in 1933 made a trip throughout Baja California, with Howard Gates. In 1935 he headed a trip to Sonora and Sinaloa for three months which resulted in the discovery of two new *Echinocerei* and two new *Mammillarias*, besides recollecting a number of species not seen since first publication. In 1936-37 he sailed for Puerto Rico, Santo Domingo, Haiti, Jamaica and Curacao to spend six months in exploration, which again netted several new species and rediscovery of many more. Marshall's interest in cacti grows more acute each year and he is still studying to try to learn half as much as he knew fifteen years ago. He now divides all the time he can spare from his occupation of interior decorator between a collection of about 1200 species of cacti and a library of about 300 books on the subject. For the past seven years he has devoted much time to writing, resulting in the publication of three books and numerous articles. There is another book, along entirely new lines, in preparation. Bill Marshall deserves all the praise we can heap upon him. Continue the good work.

One new species and 7 varieties of *Haworthias* were described by G. G. Smith in the July, 1943, number of *The Journal of South African Botany*. All of them, except one, belong in the *Coarctatae* group. The new plants are *H. fulva*, *H. Greenii* var. *silvicola*, *H. angustifolia* var. *grandis*, and five varieties of the common *H. Reinwardtii*: *valida*, *chalumensis*, *commiteensis*, *peddiensis* and *kaffirdriftensis*.

Miss W. F. Baker is the author of a new name in the Crassulaceae, *Crassula subsessilis*, hailing from Cape Province, South Africa. The plant is characterized by its divaricate habit and the uniformity of the internodes, giving the inflorescence a sessile appearance. It is described in the same issue of the above publication.

To you kind Cactus Fans who have taken time to read my monthly contribution I offer you my cheery Christmas Greetings and Prosperity in the New Year.

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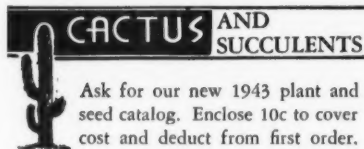
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**SPECIAL OFFER**

Beautiful specimens and showplants of many kinds and sizes. In spite of the high wages and material we offer our plants at the former prices. Ask for list.

Collections of Mexican cacti: Blooming sizes with one crest included mailed free:

100 different plants.....\$25.00

50 different plants.....\$13.00

Write to your Dept. of Agriculture for forms for the importation of cacti from Mexico. There is no charge.

**EDITOR'S NOTE:** We have examined the correspondence from the Mexican Government and note that Mr. Schmoll holds the Export Permit of Mexico. S. E. H.

**FERDINAND SCHMOLL**

(Citizen of Mexico and Member of Cactus Society)  
Cadereyta, Quo., Mexico

